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China Report

AGRICULTURE

No. 96

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RELATIONSHIP OF POPULATION CONTROL, AGRICULTURAL OUTPUT DISCUSSED

Beijing RENMIN RIBAO in Chinese 8 Jul 80 p 5

[Article by He Kang [0149 1660] and Sun Xiang [1327 5046]: "Agricultural Production and Population Growth"]

[Text] Many newspaper and magazine articles have already discussed the proposition that population must be controlled and decisive measures employed for the purpose. Here we would like to put forward some views regarding agricultural production.

As regards our agricultural resources, we cannot be satisfied with the common assertions that our land is immense and well endowed. Our country covers 9.6 million square kilometers, or 14.4 billion mu, holding third place in the world; but the Gobi Desert occupies 1.65 billion mu, 66 percent of the land is mountainous, and arid or semiarid areas account for 50 percent. Our land area is very large, but the area which can be effectively utilized is not. We have only 1.49 billion mu of arable land, a little over 10 percent of our total area, and changes are very great. In 1949 there was 1.47 billion mu, an average of 2.7 mu per person. In 1957 the area had increased to 1.67 billion mu, but because of increases in the population the area per inhabitant had dropped to 2.6 mu. Thereafter, with large-scale takeovers of agricultural land, there was a decrease of 180 million mu, so that currently the average is less than 1.6 mu person. We have 1.83 billion mu of forest land, giving us 8th place in the world, but the per capita area is 1.8 mu, placing us 121st in the world. Our forest reserve is less than 10 billion cubic meters, a per capita average of less than 10 cubic meters, and the majority is in the northeast and southwest, young forests are in the majority, and those that can be exploited amount to less than 40 percent. Currently this country's rural household fuels are 90 percent wood and straw, so that large amounts of straw cannot be returned to the fields as organic fertilizer. Our country has more than 4 billion mu of grassland, and if we add the southern grass areas there is about 5 billion mu. This is not a small quantity, but wilderness and high-altitude cold grass areas account for more than 60 percent. Since Liberation, our country's population has increased rapidly, and population density already exceeds 100 persons per square kilometer, 3 times the world average population density. More than 95 percent of our population is concentrated in the southeast, and in some very densely populated areas the density reaches more than 700 persons per square kilometer. Because our population is very large, our country's per capita agricultural resources are much lower than the world average. Our land area is only 30 percent of the world per capita average, while arable land figure is only 27 percent, our forested land figure less than 12 percent, our meadow land figure less than half, and our surface water runoff figure less than a quarter of the world per capita average.

Our reserve of agricultural resources is inadequate. It is estimated that in the future we can open and utilize an additional 1.83 billion mu of agricultural, forest and pasture land, but these reserve resources are mainly suitable for the development of forestry and livestock grazing, with the potential for development of forestry rather large. The land that can be developed for growing of agricultural crops and artificial pasturage is no more than 500 million mu (of which about 150 million mu is of good or middle quality), and is mostly located in remote border regions of Heilongjiang and Xinjiang and in the South China red soil hilly district.

The circumstances described above make it clear that we cannot take an abstract satisfaction in the size and richness of our country. The absolute size of our country's agricultural resources is large, but its relative size is small, and our reserve resources are insufficient. Accordingly, we must actively and rationally use our natural agricultural resources and also must energetically control population growth if we are to guarantee continued development of agricultural production.

In the last 30 years our country's agricultural production has expanded greatly. For the main agricultural products, by 1978 grain output had increased 1.69 times over 1949, cotton output had increased 3.88 times, output of oils had increased 1.04 times, output of sugar materials had increased 7.41 times, pigs, sheep and large livestock output had increased 2.53 times, and aquatic products output had increased 9.63 times, but the overall rate of expansion was not great. The average rate of increase for grains was 3.5 percent a year, only 0.1 percent above the worldwide average increase for the period. Especially between 1957 and 1977, the rate of increase was very slow, while population increased very rapidly. In those 20 years, total national population increased by 46 percent, while grains only increased by 45 percent, so that per capita grain output actually decreased. Between 1970 and 1977, the average rate of increase of grain output in this country was 2.9 percent, much lower than the worldwide figure of 4.7 percent. Natural disasters have had a great effect on our country's agricultural production, and output is very unstable. According to statistics, in the last 30 years every year about 460 million mu of land experienced such problems as flooding, drought, winds, hail, disease and insects, while the area in which they reached disaster proportions was 180 million mu. Our country's agriculture has not yet broken out of the irrational single-activity structure; in 1978 of total agricultural output. crop output accounted for 68 percent of the total of crops, forestry, livestock, sideline and fishery output. But of crop output value, grains accounted for 70 percent. This single-activity economic structure focused on grains not only affects the development of agricultural production but is also unfavorable to the agricultural ecological balance.

As regards the future of agricultural development, to implement the four modernizations by the end of the century not only requires a very great increase in total output, but also requires that the per capita average show a relatively large increase. Calculating from the natural rate of population increase for 1979, by the year 2000 our country's total population will be over 1.3 billion. Figuring an average per capita figure of 800 jin of grain, total agricultural output will have to exceed 1 trillion jin, and the average increase in output per year will have to be 20 billion jin. Figuring from 1,000 jin, the total grain output will have to reach 1.3 trillion jin, so that it will have to increase an average of 30 billion jin a year. But in the past 30 years the average increase has been only 13 billion jin. The years which have shown the greatest rates of increase have been only slightly over 40 billion jin, and in many years the increases in output have been small, while in some years there have even been decreases. If in the next 20 years our population increase is 100 million less, given the above per capita average, total output can be 80-100 billion jin less. From this viewpoint, population control is equal to increased production. This is especially true of cotton, sugar, oil and meat. In 1978 the per capita figure for cotton in our country was 4.6 jin, while the world-wide figure was 20 jin; the edible oils figure was 3.5 jin, while the world figure was 30 jin; the sugar figure for this country was 4.7 jin, and the world figure more than 40 jin; the meat figure for this country was 16 1/2 jin, and the world figure was 47 jin; these differences are great.

Increasing total agricultural output entails both increasing yield per unit area and expanding the area under cultivation. In the next 20 years, our country can reclaim about 300 million mu and efficient planning and utilization of existing arable land can produce an increase in 100 million mu. However, in the next 20 years basic construction will continue to take up land. In the last 20 years, an average of 25 million mu of land a year was used, and if we manage to decrease this to 10 million mu a year, in the next 20 years this will still mean 200 million mu taken over. If population increases to 1.3 billion, our per capita arable land will decrease from the current figure and will not exceed 1.3 mu. We must also note that although in these years there will be a great deal of industrial land, the rural population will increase rapidly, so that the amount of land taken up will be rather shocking. Our country has more than 6 million production brigades, and if every year every brigade takes up 1 mu, this amounts to more than 6 million mu. Since our country has a huge population and not much agricultural land, and its other resources are inadequate, we should be particularly grudging of every bit of land resources. Land is the most important resource for agricultural production, but to it must be added rational utilization and development to make it serve humanity even better. At the same time, only by controlling population increase and adapting it to increasing agricultural output can we continually increase the agricultural production rate and continuously create more and more riches so as to satisfy the requirement to improve unceasingly the material livelihood of the people of this country.

All of the above makes clear that controlling population growth will have an extremely great effect on implementation of the four modernizations. In terms of the current situation, because of the pursuit of birth control, the nationwide natural rate of population increase has dropped markedly. However, comparing rural with urban areas, the urban figure has generally decreased to less than 10 per thousand, and in many cities it is already below 5 per thousand, while in the countryside it is generally still above 10 per thousand. Our country's agricultural population is large, has a large base, and is economically and culturally behind the cities; and health care and hygienic conditions are also rather poor. In view of these circumstances, we must focus brith control work on the countryside.

8480
CSO: 4007

RURAL ECONOMY DISCUSSED BY AGRICULTURAL BANK OF CHINA

Beijing RENMIN RIBAO in Chinese 23 May 80 p 1

[Article from XINHUA datelined Suzhou 22 May: "Agricultural Bank of China Symposium Enlivens Rural Economy"]

[Text] The exchange conference to support production of commodities to enliven the rural economy, which was convened recently in Suzhou by the Agricultural Bank of China, emphasized support for rural commodity production as the guiding program for future fiduciary work in rural villages.

The exchange conference used a large amount of data to show that since the Third Plenum of the 11th Party Central Committee, heartening changes have taken place in the situation in rural villages of our country, with the entire rural economy beginning to thrive and agricultural capital thriving along with it. In 1979, banks and credit cooperatives nationwide had agricultural loans outstanding of various kinds amounting to 19.39 billion yuan, of which 17.27 billion yuan were recovered as of due date or after due date, surpassing the highest levels ever recorded. Great increases have occurred both in savings by rural villages and individual deposits. Rural economic development demonstrates that the more the commodity economy develops, the more bank regulation of funds is required and the more banks expand their source of loan funds. Vigorous support of commodity production and lively rural capital are the right ways to develop fiduciary endeavors in rural villages and to complete the fundamental task of agricultural banks.

9432
CSO: 4007

NEW PADDY TRANSPLANTER PUT IN SERIAL PRODUCTION

Beijing GUANGMING RIBAO in Chinese 26 May 80 p 2

[Article: "Nationwide Standardized Paddy Rice Transplanter Placed in Use in Rural Villages"]

[Text] A nationally standardized type machine--the series 2Z Rotating Direct Transplating Machine-Powered Paddy Rice Transplanter--was put into batch production at the end of last year following evaluation and approval, and it is now in use in rural villages.

The number of previously made machine-powered transplanting machines in use throughout the country totals 100,000, of which most are of the rotating direct transplanting type. These planters had formerly been produced by a score of plants, were a welter of types, and easily damaged parts were not interchangeable, spare parts supply was severely restricted, quality of numerous types was shoddy, prices were high, and the attitude of the farmers toward these planters was: "They can be used but they won't hold up; you might like to use them, but you don't dare," and "first year good, but second year not; by the third year, the machine is shot." As a result, it has not been possible to promote use of transplanters for a long time. In order to change this state of affairs, the Ministry of Agricultural Mechanization organized farm machinery research units and technicians concerned everywhere. Using the fairly complete original machine designs, but requiring "three -izations" (standardization of spare parts, universalization [or interchangeability], and machine-type serialization) they analyzed, compared, selected, and unified to derive the best plan for unifying the design blueprints and machine types. Testing and actual use showed results to be good. The degree of "three -ization" of this transplanter is quite high. Eighty-five percent of the parts in the whole series are interchangeable, which makes for easy specialized production. Quality is also high, costs low, and spare parts supply readily available. Now it has been decided that this type transplanter will be built by the Shanghai Farm Machinery Building and Repair Plant and six other transplanter plants in order to assure the quality of the transplanters.

9432
CSO:4007

NEW ANTIBIOTIC FOR FARM USE PRODUCED

Beijing GUANGMING RIBAO in Chinese 26 May 80 p 2

[Article: "New Broad Spectrum Antibiotic for Agricultural Use Especially Effective in Prevention of Stripe Ulcer on Rubber Trees"]

[Text] The Atomic Energy Utilization in Agriculture Institute of the Chinese Academy of Agricultural Sciences in cooperation with the Sichuan Antibiotics Industrial Institute, the Yunnan Tropical Crops Institute, and the Jiangxi Pharmaceutical Plant have successfully test manufactured broad spectrum antibiotics. These antibiotics are especially effective in the prevention of stripe ulcer on rubber trees, and have gone into formal production at the Jiangxi Farm Chemicals Plant.

Broad spectrum antibiotics possess internal absorption properties, and they can enter the seed embryo of the bluish dogbane to eradicate anthracnose bacteria without producing any chemical harm. Additionally, environmental factors such as light, warmth, acidity, and alkalinity have little effect on them. Stability in effectiveness of chemicals is quite good, and they are of high effectiveness and low toxicity, suited to present requirements for antibiotics used in agriculture. From 1976 to 1978, they were generally effective when used to control stripe ulcer on more than 1 million rubber trees in a rubber tree reclamation area in Xishuangbanna in Yunnan Province. As compared with more than 80,000 rubber trees treated in 1976, the broad spectrum antibiotics had an increased average effectiveness in the prevention of stripe ulcer of 83.2 percent. Ulcer clear, an imported agricultural chemical, has for long been considered an especially effective chemical for the prevention of stripe ulcer in rubber trees, but its effectiveness was only 74.4 percent. In a comparison of more than 450,000 rubber trees during 1977, broad spectrum antibiotics showed a greater average effectiveness of 15.3 percent than did ulcer clear, and it was quite safe as well. The same results were derived from a comparison of results with more than 400,000 rubber trees on various farms on Hainan Island between 1977 and 1979. On the basis of experiments in these two areas, a 200 unit eluctuary diluent of broad spectrum antibiotic can control development of stripe ulcer bacteria in rubber tree cuts, and if the strength is increased to 2000 units, no blackening nor dying of skin takes place at the cuts. Units involved in the experiments unanimously agree that broad spectrum antibiotics overcome the shortcomings of other farm chemicals and farm antibiotics and can entirely replace ulcer clear in preventing stripe ulcer in rubber trees.

At the same time, broad spectrum antibiotics prevent anthracnose bacteria in rubber trees, anthracnose bacteria in the bluish dogbane, gummosis in citrus trees, rot of apple trees, zebra stripe disease in sisal hemp, powdery mildew on cucumbers, and late blight of potatoes and tomatoes, demonstrating the great prevention potential of broad spectrum antibiotics.

9432
CSO:4007

TEMPERATURE-RAISING AGENT FOR SOIL IN RURAL CHINA

Peshawar KHYBER MAIL in English 21 Jul 80 p 3

[Article by Tian Sang]

[Text] Come to rural China in early Spring 10-20 days earlier than the usual seeding time and you will find green seedlings breaking through a dark, glistening thin film covering the seedbeds.

This thin and silk-like coating is a chemical cover formed by a kind of temperature-raising agent now being popularized in rural China.

Application is very simple. The paste-like agent is diluted with four to six times of water, sprayed on seedbeds or farmland and it will do the trick. An hour later, the agent will turn into a dark, paper-thick coating which will effectively reduce the water evaporation and heat loss of the soil and increase its absorption of solar heat, thus raising the temperature of the soil and preserving its moisture.

Observations conducted in various parts of the country by a group of experts from the Geographical Research Institute of the Chinese Academy of Sciences proved that with the use of such agent, water evaporation of the soil could be reduced by 75 per cent and the average daily temperature of the top soil increased by two to five degrees Centigrade. The highest temperature increase of 15 degrees Centigrade was registered at noontime.

This dark film helps speed up the transformation of organic substances in the soil into absorbable inorganic ones by activating the micro-organisms in the soil. It is neither harmful to the soil structure, nor to the growth of crops, nor to the domestic animals and human beings. The film will gradually break up in some 40 days after the seeds have sprouted and become soil nutrient.

Being popularized in the rural areas of 15 provinces, municipalities and autonomous regions, the temperature-raising agent is applicable for the nursing of cotton, rice, maize, vegetable and sweet potato seedlings and tree saplings in early Spring, remarkably increasing the output of the crops.

Take cotton in central China for instance. With the use of the agent, sowing time can be 15-20 days earlier than usual and output is 20-30 per cent higher. In the case of maize grown in China's northeast, sowing time is ten days earlier with a 10-20 per cent higher output. When the agent is applied in growing seedlings of rice in north and central China, sowing time is 10 days earlier and the output is 10 per cent higher. For vegetables in north and northeast China, sowing time is eight to ten days earlier, marketing time four to six days earlier, and output 15-30 per cent higher.

Apart from growing seedlings, peasants in China's north, northwest, and northeast also apply the agent directly to large stretches of land, which has the same effect in increasing the output of the crops.

These areas often suffer from low temperature, drought and frost in early Spring, and it has been the usual practice for the peasants to cover their cropland with straw or animal dungs to raise the soil temperature.

Forestry is another field which has benefited from the use of this agent. In a forestry centre of the Inner Mongolia Autonomous Region, the survival rate of the saplings transplanted to the mountain areas is increased from 60 per cent to 95 per cent after a treatment of the soil around the roots with the diluted agent.

In a forest experimental station in northeast China, diluted agent is also applied on the scions of the grafted pine trees, which reduces the water evaporation of the scions and helps their healing with the stocks.

In some areas in north China, the agent is utilized to combat alkalinity. This is possible because, while reducing the water evaporation of the soil, the agent slows down the movement of the salt-containing water to the surface of the soil.

The temperature-raising agent was invented in 1970 by scientists of the Geographical Research Institute of the Chinese Academy of Sciences in cooperation with the workers of the Dalian Fat and Oil Chemical Works in northeast China. In 1979, they were awarded by the State Scientific and Technological Commission with an invention prize.

The raw materials for producing the agent, mainly industrial residues of fat acid, fat alcohol, petroleum pitches and residues of edible oil, are available from nearby chemical works or village oil mills. The cost of the agent, therefore, is very low--some 0.2 yuan (U.S. $0.13) per kilo.

Up to the present, about a hundred small plants for producing this agent have been set up in the countryside.

For a speedy popularization of the temperature-raising agent in China's rural areas, scientists of the Geographical Research Institute have written a thesis entitled "Temperature-raising Agent for Soil and Its Application in Agriculture and Forestry" and other articles. A color documentary film featuring the agent has been made by the Beijing Agricultural Film Studio.

CSO: 4020

HOGS, DUCKS RAISED ON AQUATIC PLANT FEED

Beijing GUANGMING RIBAO in Chinese 21 Apr 80 p 2

[Report: "Aquatic Plant Feed Popularized in the Three Provinces of the Northeast, Saving Large Amounts of Husk and Bran Feed; Production of Meat and Poultry Increased"]

[Text] The scientific and technical personnel of the aquatic feed group of Yingkou city's Saline Land Utilization Research Institute have actively introduced and studied aquatic plant feed and have achieved success. It has already been popularized in more than 100 counties in three provinces of the northeast.

The institute began in 1972 to introduce and domesticate, conduct experiments with, and apply as feed aquatic plant resources gathered diligently from abroad. Now, over a dozen aquatic plants of southern China--green duckweed, aquatic gourd, water lettuce, and water chestnut--have been used. Their characteristics were grasped and a set of production techniques and management methods for wintering, spring propagation, and summer cultivation was summarized. Picking the seeds and cultivating the seedlings of water gourd and sexual propagation of spores of green duckweed have been successfully studied. These more than a dozen aquatic plants have already been popularized in 26 cities, administrative areas, prefectures, 154 counties, administrative areas, communes and state farms. The area of water surface for cultivation reached over 40,000 mu, saving somewhat over 400 million jin of husk and bran for animal and fowl feed. At many units, aquatic plant feed for raising hogs and fowl constitutes 70 percent of the total feed.

The results of the experiment conducted at the Gaojia farm's duck farm in Dawa County were good. Using aquatic feed to feed hogs increases their weight quickly, and using it to feed ducks produces good eggs, fattens the ducks, allows them to grow healthily, and prevents disease. The animal husbandry farm of the Dongguowei farm in Panshan County used to raise hogs and lose money. Last year, it introduced 30 mu of green duckweed and water gourd, yielding 900,000 jin of aquatic plant feed. The number of hogs raised increased to 2,361. At year's end, the number of hogs in the pen increased from 450 the year before last to 750, while a saving of 28,000 yuan was realized in the cost for feed.

9296
CSO: 4007

NECESSITY OF TRAINING INCUMBENT CADRES STRESSED

Beijing GUANGMING RIBAO in Chinese 19 Jun 80 p 1

[Text] According to a survey of portions of 22 provinces, cities, and autonomous regions by the Ministry of Agriculture, among the 2,448 cadres engaging primarily in the management of agriculture in the three levels of province, district, and county, only 3.6 percent have had specialized education in agriculture. This indicates that the cultural level of the cadres is low at present and they have little specialized knowledge. This is a problem which is both general and acute. Due to lack of specialized knowledge and ability, some cadres often do stupid things and cause losses to the party and the state. Training may fill the gap for these comrades to make them improve their skills so as to function better in productive construction. The articles by Chen Xing [7115 2502] et al are proof of this point. They demonstrate that cadre training is very beneficial for the four modernizations.

At present, the program should emphasize training of cadres of ranks above the county level, because they are in important positions and are essential to the implementation of the party's policy. When they acquire a higher level of culture and science and have specialized ability, they will not speak like outsiders and will not give foolish orders. They will consciously perform their work according to natural principles and economic rules so that they will be better able to organize the cadres of lower ranks and the masses to bring about the four modernizations, and the various projects will proceed more smoothly. Right now some areas, departments, and units feel they cannot afford to send one or two of their staff for rotational training; they are afraid of work delays. This is an expression of lack of farsightedness. The relationship between learning and working is like that between sharpening the ax and chopping firewood. "Sharpening the ax does not delay the work of chopping firewood." We have suffered enough from a lack of scientific technological, and specialized knowledge. We must not do such a stupid thing as not sharpening the ax in order to continue chopping firewood.

Cadre training is an important aspect of "intelligence investment" in construction of the four modernizations. To spend some money to improve the cultural and scientific level of the cadres is necessary and worthwhile. Of course, based upon the principle of thrift, as little money should be spent as possible to obtain as great a benefit as possible.

The form of training should be flexible and varied. Some should be of short duration and some long. Some should be after-work courses and some may be separated or partially separated from production, but the type of simple, monotonous, killing two birds with one stone sort of thing should be avoided absolutely. Training should be carried out in separate groups in ways suitable for the subject, place, and person, and attention should be given to the actual results. In view of the experience in the agricultural organizations, the cadres of the various ranks need training for several months or longer in courses separated from production if they are to obtain better results. There is also the experience of successful training programs carried out by schools of higher education, middle-level specialty schools, and related business organizations.

6168
CSO: 4007

THREE-IN-ONE SWINE VACCINE POPULARIZED

Proven Effective

Beijing GUANGMING RIBAO in Chinese 14 Apr 80 p 2

[Article: "One Injection Vaccinates Against Three Kinds of Diseases; Linxiang County et al Popularizes 'Three-In-One Vaccine for Swine' and Reduces Death Rate of Hogs"]

[Text] The Science and Technology bureau of the Ministry of Agriculture popularized the "three-in-one vaccine for swine" [3727 0005 5114 5379] in the three counties of Linxiang and Huarong in Hunan and Shangqiu in Henan. The death rate of hogs was greatly reduced. The three contagious diseases of hog cholera, swine erysipelas, and swine plague were basically controlled.

Swine plague, swine erysipelas, and hog cholera are the three major infectious diseases of hogs throughout the nation. About 30 million hogs die from these infectious diseases every year. Therefore, prevention and elimination of these three infectious diseases have become an important subject for our nation's animal husbandry and veterinary science research. In the past, our nation used a single vaccine to prevent [each] disease. One injection provided prevention against only one disease. Each hog had to be injected six times a year. The dosage was large, the number of injections was large, and the conditions for cold storage and transportation of the vaccines could not keep up. Thus the rate of prevention was not high and the effectiveness of the prevention was affected. In 1976, our nation successfully developed the "three-in-one vaccine for swine." This type of vaccine can simultaneously prevent these three kinds of diseases with one injection. Popular application has proven that the "three-in-one vaccine for swine" is safe and reliable and that its effectiveness in prevention is good. The death rate of hogs in Shanqiu County in 1978 dropped by 2.8 percent from that of 1977; 10,000 hogs were saved from death, equivalent to an increase of 500,000 jin of port for the state. At the same time, 2,100 yuan was saved in the cost of vaccination equipment and vaccines, and 5,000 laborers were freed. The rate of infection and death rate of hogs of Linxiang County dropped gradually. In 1979, 2,600 more hogs were saved from death than in 1976. The "three-in-one vaccine for swine" was welcomed by the broad masses of commune members. Now, it is being manufactured in massive quantities by the veterinary chemicals plants in Zhengzhou, Nanjing and Chengdu for use everywhere.

Unavailable in Many Areas

Beijing GUANGMING RIBAO in Chinese 16 Jun 80 p 2

[Letter to Editor: "Why Is the Three-in-One Vaccine for Swine Not Being Supplied?"]

[Text] Comrade Editor: After seeing the report "One Injection Vaccinates Against Three Kinds of Diseases" in your paper on 14 April, we are very happy about the reduction of the pig mortality rate following the extension of the three-in-one vaccine for swine in Hunan's Linxiang and other counties.

In the past we used a single vaccine to prevent each infectious swine disease. Each time, a large quantity of vaccines was needed and groups of veterinarians had to be organized to apply them. We felt that was a lot of trouble. Since the three-in-one vaccine was created, we have asked the higher level veterinary department to supply it to us. They have refused, citing as their reason the fact that the vaccine's effect is unstable and is still in the experimental stage. Last year, a paper in ZHONGGUO SHOUYI ZAZHI confirmed the vaccine's effectiveness. Again we repeatedly requested. For reasons unknown, we have not received any [vaccine]. We hope the three-in-one vaccine is made available as fast as possible so that this fruit of China's scientific research will be quickly turned into productivity.

Huo Xianbao [7202 6343 0202], Tongshan, Hubei Province

Reply to Letter to Editor

Beijing GUANGMING RIBAO in Chinese 16 Jun 80 p 2

[Text] The question asked in the letter of Huo Xianbao with regard to the problem of the three-in-one vaccine for swine is a problem expressed by many other readers in their letters to us. After making inquiries to the relevant organizations, we have obtained the following reply:

The production procedure of the three-in-one vaccine for swine is rather complex and the technical requirements high. Currently, four veterinary drug plants in Nanjing, Zhengzhou, Chengdu, and Lanzhou belonging directly to the Ministry of Agriculture and the plants of veterinary products in such provinces and autonomous regions as Hunan, Guangxi, Yunnan, Shandong, and Jiangxi are the only ones capable of producing the vaccine. The quantity of production cannot yet satisfy the needs of the various places. For this reason, the various areas must submit a plan to the National Veterinarian Drug and Machinery Order Conference, which meets once a year, before the vaccine can be supplied.

Due to the limited quantity of the three-in-one vaccine for swine, it is hoped that single, double or triple vaccines will be selected by the various areas according to the epidemic condition of swine diseases in the local areas. If a region has one type of infectious disease, the single vaccine should be used; if two types of diseases exist simultaneously, the double vaccine should be used. The three-in-one or triple vaccine should not be used without considering the condition of the epidemic so as to avoid waste. Furthermore, transportation and storage of the three-in-one vaccine require refrigeration equipment to guarantee the quality of the vaccine and its immunological effects.

6168
CSO: 4007

IMPROVED QUALITY, UNDERSTANDING OF FARM CHEMICALS NEEDED

Beijing GUANGMING RIBAO in Chinese 28 Apr 80 p 2

[Article by Zhang Xiuping [1728 4423 1627]: "Why Is It So Difficult To Popularize the Rational Use of Farm Chemical Techniques?"]

[Text] In recent years, pollution by farm chemicals in our nation is becoming serious. This affects not only the people's health but also the development of foreign trade. Our nation's farm chemical experts believe foreign nations have many good experiences in the rational use of farm chemicals. But it is more difficult to popularize these experiences in our nation. The main reasons are: 1. There are few varieties of farm chemicals that are highly effective but low in toxicity. At present, old types of farm chemicals are still being used in massive amounts. The amount of farm chemicals used is becoming larger and larger, and the remnant pollution is becoming more and more serious day by day. When one kind of farm chemical is used for an overly long time, the resistance of disease, insects, and weeds to the farm chemical increases. To eliminate disease and insect pests, more farm chemicals are used. At present, industrially more advanced nations have begun to use multiple varieties (several hundred varieties, each variety having many types), kuaigengxin (a kind of variety that can be renewed every 10 years) to eliminate disease and insect pests. Our nation's varieties of farm chemicals are few (only some 100 varieties) and their types are simple. Their rate of renewal is slow. Therefore, the amount of chemicals applied has to be greatly increased. 2. The level of scientific use of farm chemicals is low. Application of appropriate amounts of farm chemicals according to the particular disease or pest or the particular time cannot be done. In many regions at present, people still blindly believe that greatly increasing the amount of farm chemicals applied can heighten the safety coefficient of prevention of disease, insects, and weeds. Therefore, farm chemicals are used too much, and this worsens the pollution due to remnant farm chemicals. 3. Equipment for the application of farm chemicals cannot satisfy demand. At present, our nation's equipment for the application of farm chemicals is old and outdated. The numbers are few, the quality is poor, and the equipment made by the masses using old-fashioned methods cannot apply a fixed amount of farm chemicals. This frequently causes overuse of farm chemicals. 4. Because there is no coordinating agency to unify the links among the production, supply and sale, and the scientific research and application of farm chemicals, these have not been well coordinated, causing a shortage of urgently needed farm chemicals in production. Thus, people use whatever is available. The concerned departments have established prices for the farm chemicals, the old varieties are priced low, and new varieties that are highly effective and of low toxicity are priced high. The masses naturally are willing to use the lower priced varieties. 5. The work of popularizing the scientific application of farm chemicals is very weak. At present, there are few people in our nation who are engaged in the popularization of farm chemicals. To popularize the scientific and rational use of farm chemical techniques throughout the nation, experts have made the following suggestions:

1. Policies beneficial to the rational use of farm chemicals should be implemented as much as possible. The leadership at each level should take relevant and actually workable measures.

2. National farm chemical companies should be set up. Economic means should be used to coordinate the production, supply and sales, scientific research and popularization departments for concerted action.

3. Professional farm chemical propagation teams and prevention teams of mass character should be established at each locality. These professional teams should sign contracts with each commune and brigade to propagate as quickly as possible the scientific knowledge about the application of farm chemicals, so that an absolute majority of the masses of commune members can use farm chemicals rationally.

9296
CSO: 4007

NATIONAL

STUDIES ON PERCENTAGE OF RIPENED GRAIN IN HYBRID RICE

Beijing ZHONGGUO NONGYE KEXUE [SCIENTIA AGRICULTURA SINICA] in Chinese No 3, May 80 pp 44-49

[Article by Cao Xianzu [2580 7359 4371], Zhu Qingsen [2612 1987 2773], Gu Zifan [7357 5261 1164], Liu Faliang* [0491 4099 5328] and Mou Baoshan* [4924 1405 1472] of the Jiangsu Agricultural Academy: "A Study of the Fruiting Percentage of Hybrid Rice--The Relationship Between the Fruiting Percentage and the Number of Spikelets of Nanyou No 3 in a Unit Area"]

> [Text] This study was completed under the guidance of Comrade Mo Huidong [5459 1920 2767] and it received the guidance and assistance of comrades Tang Yugeng [3282 3768 1649] and Zhou Jiangshi [6760 3068 4258] of the Jiangsu Academy of Agricultural Sciences. Comrade Zhang Suying [4545 4790 5391] participated in part of the research work.

The yield of paddy rice is mainly determined by the number of spikelets (total number of grains), and the fruiting percentage. Cultivation of high yields requires a higher number of spikelets and a higher fruiting percentage. But in a unit area, the number of spikelets and the fruiting percentage frequently show a negative correlation. When the content of hydrocarbons inside the body of the rice plant is fixed, an overly increase in the number of spikelets will surely bring about severe competition for the hydrocarbons among the spikelets. The result is that some of the weaker spikelets will cease to develop because of insufficient filling materials and these will become empty and semifilled grains. Therefore, in cultivating high yielding rice crops, a most suitable number of spikelets related to the content of hydrocarbons exists. To search for this most suitable number of spikelets through appropriate cultivation techniques so that the number of spikelets actually grown approaches the most suitable number of spikelets is an important way to raise the yield of paddy rice.

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* He is presently working at the Nanjing Agricultural Academy

Hybrid paddy rice Nanyou No 3 has a strong tendency to produce dry substances during the early and middle periods of growth, and the critical weight of tillers required to produce spikelets is relatively low and large panicle forms can easily form. But during the late period of growth, the plant type becomes poor, the net assimilation rate in the colony drops rapidly, the superior tendency to produce dry materials weakens and an imbalance between the "source" and the "storage" easily emerges. The supply of assimilated products cannot meet the demands, and frequently the fruiting percentage is lower than its male restorer line and ordinary varieties. But different hybrid combinations and combinations of the same hybrid under different natural or cultivated conditions yield relatively different fruiting percentages. The fruiting percentage of hybrid paddy rice is relatively low and relatively unstable. This is also the reason why its potential for increased yield can be further developed. Therefore, since large area propagation of hybrid paddy rice, the question concerning how the fruiting percentage can be raised has received widespread attention by all. Since the beginning of 1977, we have conducted a relatively systematic study of the fruiting percentage of hybrid paddy rice. The results of the studies on the relationship between the number of spikelets and the fruiting percentage in a unit area of Nanyou No 3 are reported in the following.

Methods of Study

This experiment was conducted from 1977 to 1979 at the experimental farm of the Jiangsu Academy of Agricultural Sciences in Yangzhou, Jiangsu.

In 1977, the study centered mainly on the effects of different conditions of fertilization upon the total number of spikelets and the fruiting percentage of Nanyou No 3. Two experimental amounts of fertilization for the early period of growth and the middle and late periods of growth were set up as experimental factors. The amount of fertilization during the early period of growth was divided into two treatments, high fertilization and low fertilization. The former involved application of 20 jin per mu of ammonium sulphate 5, 10 and 15 days after transplanting, a total of 60 jin per mu. The latter involved the application of 20 jin of ammonium sulphate 5 days after transplant. The base manure and the surface manure applied were the same for both. Barnyard manure of 60 dan per mu and 30 jin per mu of calcium superphosphate were applied. During the middle and late periods of growth, sidedressings were applied at 14 intervals: From the beginning of differentiation of the first bud, fertilizers were applied every 5 days, a total of 3 sidedressings of fertilizers to stimulate flowering (the dates of applications were 21, 26 and 31 July) designated as sidedressings (1), (2), (3); 3 sidedressings to preserve the flowers (5, 10 and 15 August) designated (4), (5), (6); 3 sidedressings of pellet fertilizers (on 20, 25 and 30 August) designated (7), (8), (9); and 3 sidedressings of combined fertilization for stimulation and preservation (21 July, 5 August), stimulation and pellet fertilization (21 July, 20 August), and preservation and pellet fertilization (5 August, 20 August), designated respectively as (10), (11), (12); 1 combined treatment of fertilization for stimulation, preservation and pellet fertilization (21 July, 5 August, 20 August) designated (13), and the unfertilized control designated (14). The total number of combinations of treatments was 2 x 14 = 28. The amount of fertilizers of each treatment used in the combination of 3 fertilizations (designated 13) was 20 jin of ammonium sulphate per mu. The amount of fertilizers of each treatment used in the rest of the combinations of treatment was 30 jin of ammonium sulphate per mu.

The application of fertilizers was in two split regions. The amount of sidedressing during the early period of growth was over the entire area. Sidedressings during the middle and late periods of growth were over split areas. The sidedressings were randomly arranged and repeated twice. Each split area was 18 square meters in area. Seeds were sown on 26 May. Transplanting was on 20 June. The hole and row distance was 5 x 6 cun. Each hole contained one seedling.

In 1978, the effect of different densities and conditions of fertilization upon the total number of spikelets and the fruiting percentage of Nanyou No 3 was further studied. Transplanting density and amount of fertilization were set up as the two experimental factors. There were 6 transplanting densities: 5x10, 5x8, 5x6, 5x4, 5x2.5, 5x2 cun. Each hole contained one seedling. There were 2 levels of fertilization: high fertilization of 60 jin of ammonium sulphate per mu applied 3 times during the effective tillering period; low fertilization of 20 jin of ammonium sulphate per mu applied 5 days after transplanting. The base manure was 60 dan of barnyard manure per mu.

The areas of the experiment were split. Fertilization covered the entire area while the different densities were set up in split areas arranged randomly. Each split area was 10 square meters in area. The sowing and transplant dates were the same as in 1978.

In 1979, the density and fertilization experiments conducted in 1978 were repeated. The transplanting densities were changed to 10x10, 5x10, 5x6, 5x4, 4x3, and 4x2 cun. The rest were the same as in 1978. The experiments were repeated twice.

Method of sampling: The number of panicles in each small area was surveyed before harvest. Samples were taken according to the average number of panicles. Two groups of samples were taken from each small area. Each group consisted of five plants. Seeds were examined by the group.

Items of examination:

(1) Total number of spikelets: obtained by actual yield ÷ thousand grain weight ÷ fruiting percentage.

(2) Fruiting percentage: Obtained by the specific gravity method. Wind dried grains were selected in clear water (of specific gravity 1). Those that sink were taken as full grains and the fruiting percentage was computed.

(3) Actual yield: To unify the standard of examination of the actual yield with the fruiting percentage, the actual yield of each small area was taken as the weight of the wind dried grains proven to be full grains selected from the clear water selection process.

Results and Analysis

I. The Effects of Different Density and Conditions of Fertilization Upon the Number of Spikelets and Fruiting Percentage in a Unit Area

Table 1 shows the effects of different fertilization treatments upon the number of spikelets (represented by N_s, same in the following) and the fruiting percentage (represented by P, same in the following) in a unit area of Nanyou No 3 in 1977.

The results of mean square analysis and covariance analysis of data listed in Table 1 is tabulated in Tables 2 and 3.

It can be seen from Tables 1, 2 and 3:

(1) Regardless of the conditions of fertilization during the early period, each sidedressing exerts a very obvious effect upon the number of spikelets and the fruiting percentage in a unit area of Nanyou No 3 from the beginning of differentiation of the buds. The F values of N_s and P are respectively 8.20** and 8.42** during the early period of growth in the low fertilization group, and 3.54** and 4.04** respectively during the early growth period in the high fertilization group. These have reached the visible and very visible levels of influence.

(2) The differences in the fruiting percentages among different fertilization treatments are mainly formed by the different numbers of spikelets. The fruiting percentages of the high fertilization group and the low fertilization group can be corrected by the following equations to standardize the number of spikelets:

Low fertilization group: $\overline{PN_s} = P + 7.6923\ (N_s - 3.7714)$
High fertilization group: $\overline{PN_s} = P + 12.7188\ (N_s - 4.2418)$

($\overline{PN_s}$ is listed in the last column of Table 1.) The differences among the fruiting percentages of each fertilization is not obvious. The F values are respectively 1.58 and 2.62. This shows the differences in the fruiting percentage created by each fertilization treatment are indirect effects mainly due to changes in the number of spikelets. The different

Table 3. The Effect of Different Fertilization Treatments Upon the Number of Spikelets (N_n) and Fruiting Percentage (P) of Nanyou No 3

2) [illegible]	1) [illegible]	I N_n (万/m²)	I P (%)	II N_n (万/m²)	II P (%)	$\bar{N}_n$ (万/m²)	$\bar{P}$ (%)	[illegible] (%)
3)	1	4.59	58	4.38	61	4.485	59.5	64.18
	2	4.09	63	4.11	62	4.100	62.5	66.03
	3	3.94	64	4.11	64	4.025	64.0	65.30
	4	3.90	66	3.57	69	3.735	67.5	67.22
	5	3.54	71	3.70	67	3.620	69.0	67.44
	6	3.48	71	3.38	72	3.430	71.5	68.87
	7	3.38	71	3.04	74	3.210	72.5	68.18
	8	3.14	72	3.24	69	3.190	70.5	66.02
	9	3.34	69	3.04	69	3.190	69.0	64.53
	10	4.12	61	4.76	54	4.440	57.5	62.64
	11	4.12	63	4.75	56	4.435	59.5	64.60
	12	3.84	67	3.60	62	3.720	64.5	64.10
	13	3.96	64	4.50	60	4.230	62.0	65.63
	14	3.03	75	3.01	71	3.020	73.0	67.22
4)	1	4.58	60	4.78	58	4.680	59.0	64.67
	2	4.25	59	4.46	58	4.355	58.5	57.94
	3	3.44	77	4.32	62	3.880	69.5	64.90
	4	4.23	69	4.02	67	4.125	68.0	66.51
	5	4.22	68	4.46	63	4.340	65.5	66.75
	6	4.21	69	3.99	64	4.100	66.5	64.70
	7	4.13	68	3.93	65	4.030	66.5	62.81
	8	3.91	70	3.73	70	3.820	70.0	64.64
	9	3.45	73	4.09	65	3.770	69.0	63.60
	10	5.20	50	4.66	54	4.930	52.0	60.75
	11	4.68	56	4.67	53	4.675	54.5	62.18
	12	4.30	61	3.84	66	4.070	63.5	61.30
	13	4.66	56	4.38	57	4.520	56.5	60.04
	14	4.06	63	3.72	67	3.890	65.0	66.53

Key:

1. Regional groups
2) Treatment
3) Low fertilization during early growth period
4) High fertilization during early growth period

amounts of fertilization and the time of fertilization first create the differences in the number of spikelets in a unit area, and then they create the differences in the fruiting percentages. The direct effect of fertilization treatment upon the fruiting percentage is minimal (the F among the corrected average numbers is not obvious).

In 1978 and 1979, the effect of dense application of fertilizers upon the number of spikelets and the fruiting percentages in a unit area of Nanyou No 3 was further studied. The results obtained were consistent with those

Table 2. Square Deviation Analysis and F Values of Data in Table 1

1) [illegible]	2) [illegible]	Ns			P		
		3) [illegible]	4) [illegible]	F	3) [illegible]	4) [illegible]	F
		5) [illegible]					
6) [illegible]	1	0.0240	0.0240	<1	26.03	26.03	4.10
7) [illegible]	13	6.8732	0.5288	8.20**	694.46	53.42	8.42**
8) [illegible]	13	0.8372	0.0646		82.47	6.34	
		9) [illegible]					
6) [illegible]	1	0.0026	0.0026	<1	57.14	57.14	3.162
7) [illegible]	13	3.5695	0.2565	3.06*	949.88	73.07	4.04**
8) [illegible]	13	1.0913	0.0839		234.88	18.07	

Key:

1) Source of variation
2) Degree of freedom
3) Squared sum
4) Mean square
5) Low fertilization group during the early growth period
6) Among regional groups
7) Among treatment
8) Error
9) High fertilization group during early growth period

Table 3. Covariance Analysis of Data in Table 1

1) [illegible]	2) [illegible]	3) Ns [illegible]	4) P [illegible]	5) Ns, P [illegible]	6) [illegible]	7) [illegible]			
						8) [illegible]	9) [illegible]	10) [illegible]	F
		11) [illegible]							
12) [illegible]	26	7.7104	776.93	−72.81		25	89.38		
13) [illegible]	13	6.8732	694.46	−66.37					
14) [illegible]	13	0.8372	82.47	−6.44	−7.6923	12	32.93	2.74	
15) [illegible]						13	56.45	4.34	1.58
		16) [illegible]							
12) [illegible]	26	4.7118	1184.71	−68.96		25	274.16		
13) [illegible]	13	[illegible]	949.86	−55.08					
14) [illegible]	13	1.0913	234.86	−13.88	−12.7186	12	58.31	4.86	
15) [illegible]						13	161.85	12.76	2.62

[key on following page]

Key: [to Table 3]

1) Source of variation
2) Degree of freedom
3) Squared sum
4) Squared sum
5) Product sum
6) Regressive coefficient
7) Discrete regressive analysis
8) Degree of freedom
9) Squared sum
10) Mean square
11) Low fertilization groups during early growth period
12) Treatment + error
13) Treatment
14) Error
15) Correction of the differences among averages
16) High fertilization groups during early growth period

obtained in 1977. Bo covariance analysis, the number of spikelets is corrected and standardized for each density and fertilization treatment and the differences among the corrected average numbers for the fruiting percentages were not obvious. In 1978, the F values were 4.09 ($F_{0.05}$ = 6.59) and in 1979 the Fa was 2.14 ($F_{0.05}$ = 2.76).

The experimental conditions for the 3 years were different but the results were the same. This shows that the effect of different densities and applications of fertilizers upon the fruiting percentage of Nanyou No 3 is only superficial. The heart of the problem is the total number of spikelets in a unit area.

II. Since the effects of different densities and conditions of fertilization upon the fruiting percentage of Nanyou No 3 are mainly manifested by the number of spikelets, the important way to raise the fruiting percentage and the yield of Nanyou No 3 is to control the total number of spikelets in the entire field within an appropriate range so that the balance between the "source" and the "storage" can be maintained on the basis of a higher level.

The results of correlative analysis of the experimental data of the years from 1977 to 1979 are listed in Table 4.

It can be seen from Table 4 that the number of spikelets and the fruiting percentage of Nanyou No 3 for each year show a visible negative linear correlation. Although in 1979, the correlation coefficient was lowered by the occurrence of low temperatures during the flowering period (1-3 September continuing for 3 days the temperatures were all lower than 22.5°C) of plants that headed at the end of August, the level of visible effect was still reached. The average correlation coefficient for the 3 years was -0.8190**. This indicates the fruiting percentage of Nanyou No 3 drops as the number of spikelets in a unit area increases.

The negative correlation between the number of spikelets and the fruiting percentage described above necessarily brings about the following conclusion. Within a definite range, as the total number of spikelets is lowered,

Table 4. Correlative Coefficients of the Total Number of Spikelets and Fruiting Percentage of Nanyou No 3

年 份 1)	n−1	$\Sigma(N_s - \overline{N}_s)^2$	$\Sigma(P - \overline{P})^2$	$\Sigma(N_s - \overline{N})(P - \overline{P})$	$\overline{N}_s$	$\overline{P}$	r
1977	33	3089253	890	−46482	2663.12	64.47	−0.8865**
1978	16	713506	261	−12252	2597.6	78.71	−0.8978**
1979	23	1398714	473	−16536	2589.7	60.27	−0.6429**
2) 和	72	5201473	1624	−75270	2624.8	68.27	−0.8190**
3) 总变异	74	6293602	4667	−83361			

Key: 1) Year 2) Total 3) Total variation

the fruiting percentage can be raised. But under this condition, the unit area yield is not necessarily increased because the yield of paddy rice is mainly determined by the number of filled grains and the number of filled grains is affected both by the number of spikelets and the fruiting percentage. Therefore, the highest number of filled grains of the entire field is not the number of filled grains at the highest fruiting percentage but the number of filled grains when the product of the fruiting percentage and the number of spikelets reaches a maximum. Thus, the regressive equation based on the fruiting percentage and the total number of spikelets is:

$$P = a + bN_s \quad (a > 0,\ b > 0) \tag{1}$$

Thus the repressive equation of the number of filled grains (Nr) and the total number of spikelets should be:

$$Nr = PN_s + aN_s + bN_s^2 \tag{2}$$

Equation (2) is a parabolic equation. Nr has a maximum value. To obtain the value of N_s ($N_{s.opt}$), at the maximum value of Nr, the first order derivative of equation (2) can be derived and allowed to equal to 0, then:

$$\frac{dp}{dN_s} = a + 2bN_s = 0$$

$$N_{s.opt} = \frac{-a}{2b}$$

In the above, $N_{s.opt}$ is the number of spikelets when Nr is at its maximum value. To obtain the theoretical values of the most suitable numbers of spikelets for each year, the data in Table 4 can be further subjected to discrete regressive analysis to obtain Table 5:

Table 5. Discrete Regressive Analysis of the Differences in the Fruiting Percentage and Number of Spikelets Among the Years

1) 变异来源	6) 离回归分析			
	7) 自由度	8) 平方和	均 9) 方	F
2) 以3年P和Ns的总回归方程表示各个年份	73	2754.25		
3) 以各年P和Ns的回归方程表示各个年份	69	518.74	7.52	
4) 回归系数间的差异	2	16.03	8.01	1.06
5) 回归高度间的差异	2	2219.48	1109.74	147.57**

Key:

1) Source of variation
2) Using the total regressive equation of P and N_s of 3 years to represent each year
3) Using the regressive equation of P and N_s of each year to represent each year
4) Differences among the regressive coefficients
5) Differences among the regressive orders
6) Discrete regressive analysis
7) Degree of freedom
8) Squared sum
9) Mean square

Table 5 shows that for each year, there is a common regressive coefficient (-75270 ÷ 5201473 = -0.0144709) of the fruiting percentage versus the total number of spikelets and different regressive orders. Therefore, the most suitable regressive equation for the number of spikelets versus the fruiting percentage of Nanyou No 3 from 1977 to 1979 are:

$$1977:\quad Pc = 103.01 - 0.0144709\, N_s$$

$$N_{s.opt} = 35592000/\text{mu}$$

$$1978:\quad Pc = 116.30 - 0.0144709\, N_s$$

$$N_{s.opt} = 40184000/\text{mu}$$

$$1979:\quad Pc = 103.75 - 0.0144709\, N_s$$

$$N_{s.opt} = 35848000/\text{mu}$$

The above theoretical values of $N_{s.opt}$ show the most suitable number of spikelets for Nanyou No 3 is between 35 million and 40 million mu. This theoretical value is very close to the actual value of high yielding fields in the regions along the river in Jiangsu where this experiment took place (Yangzhou in Jiangsu).

The most suitable number of spikelets of Nanyou No 3 varies in different years. Generally, when the conditions of sunshine and temperature especially during the period of formation of the economic yield are good, the amount of photosynthetic production is larger and more dry substance can be provided to fill the grains and the most suitable number of spikelets is also higher. For example, the number of hours of sunshine during the fruiting and maturation periods of Nanyou No 3 in 1978 was 45.8 percent and 45.6 percent more than 1977 and 1979 respectively. Total cumulative temperatures were higher by 3.5 percent and 4.8 percent. Therefore, the theoretical value of the most suitable number of spikelets was also higher than those of 1977 and 1979 by 12.9 percent and 12.1 percent. This indicates that although the most suitable number of spikelets of Nanyou No 3 has a definite range, this range can be surpassed by means of breeding and cultivation to raise the production of dry substance. On the other hand it also indicates that within a definite range of the number of spikelets, elevating the production of dry substances can also realize the goal of obtaining a high fruiting percentage and high yield.

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REGULATIONS FOR METEOROLOGICAL OBSERVATION SUMMARIZED

Beijing QIXIANG [METEOROLOGY] in Chinese No 11, 10 Nov 79 pp 10-17

[Article: "New Regulations Concerning 'Standard Instructions for Ground Meteorological Observation'"]

> [Text] Editor's Note: The new "Standard Instructions for Ground Meteorological Observation" (abbreviated "new standard instructions" compiled by the Central Meteorological Bureau are being promulgated in 1980. To help the broad masses of observers and concerned departments grasp in a timely way the standard instructions and their implementation, we have taken the comparative table of new and old standards compiled by comrades Man Zaixin [3341 0961 9515), Xu Jiahou [1776 1367 0230] and Xue Minhe [5641 3046 0735] of the Sichuan Provincial Meteorological Bureau as the foundation and have introduced the main content of the new standards and regulations in the following (Articles of the old regulations are so indicated.)

Chapter I. General Articles

1. Nature of the "standards": "The standard instructions" "are the rules of operation and technical regulations of surface meteorological observation by meteorological stations."

2. The right of compilation, revision, and explanation of "standard instructions" belongs to the Central Meteorological Bureau.

3. Naming and classification of stations: All meteorological stations are called national meteorological stations. According to their different duties, there are two types: basic national stations, and general national stations.

4. Classification of items of observation: These include tasks to be performed on a nationwide basis and methods to be used on a nationwide

basis (subdivided into subjects of observation required of all stations and subjects of observation required by the provincial authorities), and subjects of observation required by each province, locality, and county and the methods established by them.

5. Changes in subject of observation: Accumulation of snow-- This includes observation of the depth of snowfall and the pressure of the snow. The depth of snowfall is an item of observation required of all stations. Pressure of snow is an item required by provincial authorities.

Evaporation--This includes small-scale evaporation and E-601 type evaporation. Small-scale evaporation is an item of observation required of all stations. E-601 type evaporation is an item required by provincial authorities.

Ground temperature--Ground surface temperature is an item of observation required of all stations. Bent tube ground temperature is hereafter called shallow layer ground temperature. Straight tube ground temperature is hereafter called deeper layer ground temperature. Both are items of observation required by provincial authorities.

Sunshine--Item of observation required of all stations.

Frozen earth--Item of observation required by provincial authorities.

Accumulation of ice on powerlines--Item of observation required by provincial authorities.

Systematic, indicative, and regional clouds and synoptics--Items to be observed according to the need and the method established by provincial, regional, and county meteorological bureaus (stations).

6. Timeframes for records: The duration of sunshine is recorded according to the time of sunset as the end of day. Other items are recorded taking 2000 hours Beijing time as the standard. In the old regulation, 2400 hours Beijing time was the standard.

7. Procedures and time of observations: Procedures for observation shall be established by individual stations. The procedures shall be standard for the entire station. Atmospheric pressure must appropriately approach the normal point. Clouds, energy, weather, atmospheric temperature and humidity, rainfall, wind, and barometric pressure shall be observed every 45-60 minutes. Ground temperature, depth of snow, pressure of snow, frozen earth, and evaporation shall be observed every 40-10 [as published] minutes. The national standards in the old regulations stipulated that clouds, energy, weather, wind, ground temperature, atmospheric temperature, humidity, rainfall and barometric pressure were to be observed every 40-58 minutes. Current synoptic phenomena were to be

observed at fixed times every 43-45 minutes. Barometric pressure was to be observed at fixed times every 56-58 minutes. Other items were to be observed at established times or after others had been observed.

8. Stations charged with duty of drawing up, compiling, and issuing weather maps and reports: Weather maps and reports shall be adjusted after recording the highest atmospheric temperature at 0200 hours and after recording the lowest atmospheric temperature at 1400 hours. Each year between 1 April and 15 October, the amount of rainfall shall be recorded daily at 0800 hours. When the lowest ground surface temperature is likely to be ≤3.0°C, the lowest ground surface temperature shall be recorded at 0800 hours.

9. Time to replace paper (except sunshine-recording paper): To be determined by the provincial meteorological bureaus.

Chapter II. Field of Observation

1. Distance between obstacles and edge of the field of observation: An obstacle standing alone shall be situated at a distance three times its height or more. Obstacles in rows shall be situated at a distance 10 times their height or more. The highest point of the horizontal line of a relatively large body of water shall be situated at a horizontal distance at least 10 m or more. Tall-stem crops shall not be planted within 10 m of the field of observation.

2. Area of field of observation: Basically the area shall be 25 x 25 m^2. When conditions prohibit this, the area should be 16 (east-west direction) x 20 (south-north direction) m^2. Fields of observation on high mountains and on islands in the ocean are exempt from such requirements.

3. Width or roads inside field of observation: 0.3 - 0.5 m.

4. Distances between instruments in field of observation: Distances between instruments situated in the north and south shall be no less than 3 m, distances between instruments situated in the east and west shall be no less than 4 m, distances of instruments from the surrounding fence shall be no less than 3 m.

5. Installation requirements and positions of instruments: A standard tabular list defining definite positions shall be issued, including allowable margin of error of positions of installation of instruments at time of inspection.

6. Treatment of accumulated snow inside field of observation: Snow covering roadways inside the field of observation shall be removed. Accumulated snow covering all other ground surfaces inside the field of observation shall be kept in its natural state.

7. Moving the station and contrasting observations: See Appendix 1 of Standard Instructions.

Chapter III. Clouds

1. Definition of clouds: Clouds are conglomerate bodies of small droplets of water or ice crystals or a mixture of the two suspended in the atmosphere. Sometimes clouds also include some larger raindrops and ice and snow pellets. The bottom portion of the clouds does not touch the surface of the ground.

2. Classification of clouds: Clouds are classified into 3 families, 10 categories and 29 types according to their outer shapes, structural characteristics, and height of the bottom portion of the clouds. Nighttime stratocumulus clouds are included as nimbus stratocumulus clouds. Pod-shaped cumulostratus clouds are added as an additional type of cloud.

3. Chinese scientific name for Cs nebu: It is named even cirrostratus. In the old regulations it was named thin curtain cirrostratus.

4. When the sky is covered with clouds but there are gaps in between the clouds, the amount of clouds is noted as 10^-. In the old regulations, it was noted as $\boxed{10}$.

5. Notation for the amount of clouds distinguishable by the amount and the shape in the sky when there is blowing snow and fog: (1) When the sky is entirely distinguishable, the actual amount of clouds and the shapes of clouds are recorded without further symbolic notation. (2) When clouds throughout the sky are distinguishable, the amount of clouds is noted as 10/10. Notations for blowing snow or fog must be recorded in the column for cloud shapes, and discernible cloud shapes must be noted. (When there is a snowstorm, the sky will be indistinguishable otherwise it would be blowing snow. There is thus no such situation.)

6. Recording and observing clouds by stations on mountains: (1) Clouds whose bottom portion is above the station are noted as ordinary stations would note them; (2) When the bottom portion of the cloud is lower than the station but the top of the cloud may be higher or lower than the station, such clouds should be recorded; (3) When the cloud covers the station, the cloud is recorded as fog. When the cloud moves away from the station, it is recorded as a cloud. When changes are rapid, the cloud is recorded as fog and further explained on the dotted line.

7. Observation of altitude of clouds and upper right corner notation of altitude of clouds: At stations where conditions allow it, the altitude of the clouds should be actually measured. When clouds cannot actually be measured, an estimate should be made at the time a report is issued. When using balloons, lamps, and airplanes to actually measure the altitude of clouds, an "S" should be noted on the upper right corner of the altitude of the cloud. Such a notation is not necessary when using eyesight to estimate, using empirical formulas to calculate, or objects to estimate the altitude of clouds.

8. Recording simplified cloud forms three times by observation station: canceled.

9. Telecoding for clouds: Not included in standard instructions.

10. Observation and recording of moving clouds: When such clouds have already appeared in the area of observation, their symbols are recorded and their time of occurrence should be noted. For example: COTRA 9^{20}.

Chapter IV. Horizontal Visibility

1. Standard for "visibility": When the profile and the form of the target object can be recognized against the background of the sky, it is "visible." In the old regulations, an object was "visible" even when only part of its profile could be recognized.

2. Viewing angle of target object for visibility: The viewing angle should be between 0.5 and 5.0°. In the old regulations, the angle was not to be smaller than 0.3°.

3. Method of recording visibility: Records should be in km units, carried to the first decimal. The 100th digit is rounded off. Distances less than 0.1 km are recorded as 0.0.

4. Observation of nighttime visibility: Nighttime visibility must be observed and recorded.

5. Observation of visibility in deserts and on ocean islands where there are few ground objects: Artificial target objects could be set up to estimate visibility within 1.0 km. Visibility over seas and lakes shall be judged according to the "Table for Visibility References Over the Sea."

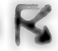
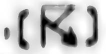
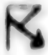
6. Visibility of light source map: Changed to the use of the distance conversion map for visible light source, as stipulated in the Air Force meteorological observation standards with supplements.

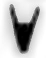
Chapter V. Synoptic Phenomena

1. Definition of "synoptic phenomena": Synoptic phenomena mean all dry objects, frozen objects, water vapor and condensates (except clouds), rainfall produced by the ground surface and suspended in the atmosphere, electrical and light phenomena, as well as some characteristics of wind.

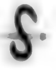
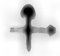
2. The number of types of synoptic phenomena has been changed from 46 to 34:

(1) Fog--the three types ≡ , ≡ , ≡ , are combined into ≡ ;

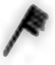
(2) Thunderstorm--The two types  , are combined into  ;

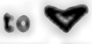
(3) Soft rime--The two types V ,  are combined into V ;

(4) Hailstone--The two types △ , ▲ are combined into △ ;

(5) The name  , and  are changed to sand and dust storm and blowing snow;

(6) The name)(is changed to tornado. Funnel-type cloud bodies that appear in the sky or whirlwinds that appear over land (water) are all noted as tornadoes;

(7) The symbol for strong wind is changed to  ;

(8) The symbol for sandstorm is changed to  . The definition is revised as: An occurrence of sudden increase in wind velocity, a sudden change in wind direction, and the synoptic elements undergo violent change...;

(9) Seven types of synoptic phenomena--shallow fog, vapor fog, rainbow, solar halo, lunar halo, solar corona, and lunar corona--are canceled.

3. Recording frost and dusty whirlwind: Beginning and ending times shall not be recorded.

4. Method of recording strong winds: (1) Strong winds are recorded once, when the time between occurrences is 15 minutes or less. When the time between occurrences is longer than 15 minutes, new beginning and ending times are recorded. (2) The beginning and ending times are connected by solid lines. In the old regulations, when the time between occurrences was 1 minute or longer, two separate times were recorded.

5. Definition of snowstorm: (1) Horizontal visibility is generally less than 1 km; (2) During a snowstorm the skies are indistinguishable; therefore judgment cannot be made as to whether it is snowing at the time or not.

6. Definition of accumulation of snow: Snow (including graupel, rice-like snow, ice pellets) covers the ground surface....

7. Definition of thunderstorm: Discharge of electricity in clouds containing rain, between clouds, or between clouds and the ground. Thunderstorm has lightning and sounds of thunder. Sometimes lightning is not visible but thunder can be heard.

8. Definition of lightning: Lightning is the visible electrical light during discharge of electricity that occurs in clouds containing rain, between clouds, or between clouds and the ground. Thunder is not heard. It used to be called distant electricity.

9. Definition of ice pellets: ...diameter less than 5 mm.... In the old regulations: 1 - 3 mm.

10. Definition of hailstone: There is no specific regulation concerning diameter. In the old regulations: above 2 mm.

11. Recording thunderstorms: Recording of thunderstorms must include their entirety, and their system must be determined.... Disorganized recording must be avoided.

12. Method for recording direction of thunderstorms: (1) When the direction at the beginning and the direction at the end differ by 180 degrees or more, an intermediate direction should be noted between the beginning and ending directions of the course of the thunderstorms; (2) When the direction is not clear or when thunder is heard on many sides and the system is not easily determined, directions can be omitted. (3) When the thunderstorm passes over the zenith, the symbol for the zenith "Z" should be noted.

13. Items for determining hailstone: (1) The greatest diameter of hailstones in whole numbers in mm units; (2) When the diameter of the largest hailstone is less than 10 mm, the greatest average weight of the hailstones should be simultaneously measured in whole numbers of grams.

14. Recording of simplified synoptic phenomena three times by observation stations: Canceled.

15. Survey and record damage caused by synoptic phenomena: Records are written in the column titled "brief description column." In the old regulations, such records were written in "special description column."

16. Records of accumulation of snow on high mountains within observed area: Accumulation of snow on high mountains is recorded and described once in that month, including the name of the mountain, the direction, the dates accumulation begins and ends (within the month). In the old regulations, the line of accumulation of snow was recorded and described for the month when accumulation continued for 15 days or more.

17. Major points of differentiation of partial synoptic phenomena that are easily confused: These are comprehensively listed in tables and included in the standard instructions.

18. Codes for current synoptic phenomena: Not included in the standard instructions.

Chapter VI. Atmospheric Pressure

1. Position of installation of barometer: The barometer must be installed inside the atmospheric pressure chamber. Where there is no atmospheric pressure chamber, it can be installed inside a protective case.

2. The Name of barometer: (1) mobile trough-type (Fuding type) barometer; (2) Stationary trough-type (Kouwu type) barometer.

3. Use of barometer: After installation, the barometer must be stabilized for 3 hours before use. In the old regulations, the requirement was 2 hours.

4. Adjustment of graduations on barometer: When the difference between recorded values and actual measurements is great, the indicator should be adjusted.

5. Coordinate values of atmospheric pressure on automatic recording paper: When the coordinate values of atmospheric pressure of the automatic recording paper are incorrect, they should be adjusted according to the range of atmospheric pressures at the station.

6. Supplementary measurement when paper is changed: Canceled.

7. Automatic recording of day's highest and lowest atmospheric pressure: Must be selective.

8. Method of selecting highest and lowest atmospheric pressure: (1) In a day (2000-2000 hours), locate the highest and lowest readings from the automatic recording paper and place an arrow there; (2) The instrumental error computed from the fixed time observation records next to the arrow marks is then used to calculate the instrument error values by interpolation; (3) Take the instrument error at the normal point near the highest (lowest) time for adjustment; (4) When the highest (lowest) point is between two normal points, take the instrument error of the latter normal point for adjustment; (5) When the highest (lowest) value after adjustment is lower (higher) than the observed value of fixed time on the same day, take the atmospheric pressure of the station which is actually measured at that fixed time.

9. When automatic recording curve jumps (atmospheric pressure 0.3 mb, temperature 0.3°C, humidity 3 percent): Instrument error must be separately calculated after marking, and adjustments should be made section by section.

10. Inclination and variation of atmospheric pressure: Not included in standard instructions.

Chapter VII. Air Temperature and Humidity

1. Change in name of items: Absolute humidity is changed to water vapor pressure.

2. Change in items: Dew point temperature shall be recorded to one decimal place. Saturation error is eliminated.

3. Maintenance of thermometer screen: The thermometer screen shall be painted once every 1 to 3 years depending on condition.

4. Procedures concerned with cleaning thermometer screen: Before cleaning, the instruments should all be placed in the backup thermometer screen. After cleaning, the thermometer screen must be completely dried before the instruments are replaced. Cleaning the thermometer screen should not interfere with observation and recording.

5. Use of dry-wet ball type thermometer: The pair issued by the higher authorities should be used simultaneously and replaced simultaneously.

6. Use of water in wet ball type: Use distilled water.

7. Regulations for soaking wet ball type in water between two fixed time observations: Canceled.

8. Procedures for fixed time observations using instruments inside the thermometer screen: Dry ball, wet ball, lowest temperature alcohol column, capillary humidity meter, highest temperature thermometer, floating dial of lowest temperature thermometer, adjustment of highest and lowest temperature thermometer, reading of thermometer and humidity meter, and time notation.

9. New instrument: Ventilating dry and wet meters of thermometer screen.

10. Method of adjusting highest temperature thermometer: Use the hand to hold the body of the meter.... Use the arm to move the meter back and forth....

11. Supplementary adjustment to lowest temperature meter: The indicated degree on the alcohol column of the lowest temperature meter should be compared to the indicated degree on the dry ball thermometer at 2000 hours on the 1st to 5th days of each month (all corrected for instrument error). When the average error of the results of the comparison...is 0.5°C, the lowest temperature meter should be replaced and the average errors during these 5 days should be corrected according to the lowest temperatures on each of the 5 days. If the meter cannot be replaced, comparative readings should be conducted continuously at 2000 hours each day, and the average supplementary correction values for the entire month should be calculated

and added to the lowest temperature of each day. When a new lowest temperature meter is installed to replace the old one, comparative observations as described above should be conducted for the first 5 days after installation. The concept of jumping variation is eliminated.

12. Recording readings of capillary meter beyond 100 hours: Readings shall be made using the method of extrapolation. Parentheses ( ) shall be added to the record. In the old regulation, parentheses were not added to the record.

13. Method of drawing humidity correction map: One and a half months prior to the average date of many years on which the temperatures fall to -10.0°C, the daily fixed time readings are used to draw the correction map. There are also three principles that determine whether the correction map can or cannot be used.

14. Initial use of capillary meter: The meter should be completely installed 1-1/2 months before the temperature drops to -10°C. When the temperature drops to below -10.0°C, relative humidity can be measured using the capillary humidity meter of the humidity meter, or the dryness and wetness meter can be used temporarily.

15. Selection of lowest humidity on automatic recording paper: ...If the lowest value after correction is greater than the actual measurement at a fixed time of day, the record of that time is directly selected as the day's lowest relative humidity.

Chapter VIII. Wind

1. Standard instruments: (1) EL type electric anemorumbometer, DEM$_6$ type portable anemorumbometer, dyne type anemorumbometer; (2) When the EL type electric anemorumbometer breaks down or is frozen hard and cannot operate normally, the dyne type anemorumbometer or the DEM$_6$ type portable anemorumbometer can be used for measurements.

2. Correction of time difference of automatic recording paper of EL type electric anemorumbometer: Correction is not required if the total error within 24 hours is $\leq$ 20 minutes. When it is $>$ 20 minutes it must be corrected. In the old regulations, correction had to be made when it was $>$ 10 minutes.

3. Selection of greatest wind speed of the day (EL type): When the greatest wind speed of the day occurs twice or many times during the day, the wind direction and the time of termination of any one can be selected.

4. Extreme values of dyne type anemorumbometer: (1) Correction of time difference is not required for automatic recording paper; (2) The value of wind velocity must be adjusted by the air density; (3) When the extreme value occurs twice or more, any one can be chosen.

5. Method of estimating wind direction and wind force by sight and the table of wind force: These are included in the appendices of the standards. When converting to medium numerical values of equivalent wind speed, whole numbers shall be used. Sea and land indicators are also revised.

Chapter IX. Rainfall

1. Installed height of rain gage: The aperture of the gage should be 70 cm above ground surface. In winter, where snow accumulation is deep and when the accumulated snow is over 30 cm, the aperture of the gage should be 1.0 to 1.2 m above the ground.

2. Tools for measuring amount of rainfall: Liquid or solid rainfall can be measured according to the situation, using either a measuring cup or a special scale. If a special scale is not used, the measurements must be converted.

3. Amount of rainfall for maps and reports: When equipped with a remote-measuring rain gage, the remote-measuring rain gage should be used. When a remote-measuring rain gage is not available, the rain gage can be used for measurements.

4. Additional notation when recording light rainfall: Canceled.

5. Supplementary measurement of rainfall involving daily records: When there is no rainfall before or at 2000 hours when fixed time measurements of rainfall are taken, and when there is rainfall afterward until the following 2000 hours (or lasting until the next day), or when there is already rainfall at 2000 hours or before when fixed time measurements of rainfall are taken, but afterward up to the following 2000 hours the rainfall stops, then supplementary measurement of rainfall should be taken at 2000 hours.

6. Equivalent measurement of pure fog, dew, frost: The amounts of pure fog, dew, frost, icicles, soft rime, and blowing snow are not treated as rainfall. The amount of blowing snow must be measured by collection for use in calculating the amount of evaporation. In the old regulations, when the amount of fog, dew and frost reached 0.05 mm or above, the amounts were recorded and the appropriate synoptic symbols were added.

7. Amount of water of snowstorms: When a snowstorm occurs, the amount of water should be observed.

8. Types of gages: Inverted funnel-type remote measuring rain gage and the siphon type rain gage.

9. Procedures involving rain gage when rainfall is solid (except for icing conditions): When there is solid rainfall, and when it melts into water as it falls, it is read and recorded normally. Otherwise, the water

container should be covered (except for hail). The instrument is then not used. The situation is noted in the remarks column of the observation log. Recording is continued when the rainfall is liquid again.

10. Changing automatic recording paper: When the rain is greater at the time the paper is changed, and it is estimated that the rain will not slacken or stop, then the needle can be lifted, the roller can be turned, and a new recording can commence at an accurate time on the original automatic recording paper (where there are no records of rainfall or when the rainfall lines will not overlap). The paper can be changed immediately after the rain slackens or stops. The paper removed from the instrument should be properly marked, and dates should be noted on the curves.

11. Should automatic recording paper be changed when amount of fog, dew and frost is ≥ 0.1 mm: The paper is not changed, but after the paper is removed notations should be made on the back of the paper.

12. Organizing automatic recording paper: (1) Calculate only the hourly amount of rainfall; (2) The time of hail is recorded on the back of the paper; (3) Extreme values are taken from the record at yearend according to instructions on the annual report.

Chapter X. Depth of Snow and Pressure of Snow

1. Observation ground: An observation ground should be set aside near the observation field. Before winter arrives, the ground should be leveled and prepared. Weeds should be removed and markers should be set up.

2. Procedures for observing accumulation of snow when snowfall begins after 0800 hours and there is no accumulation of snow at that time: A supplementary measurement should be taken at either 1400 hours or 2000 hours.

3. Requirements and time of measuring snow pressure (originally density): Snow pressure is measured after measuring the depth of snowfall (or supplementary measurement). Three samples are taken for measurement.

4. Supplementary measurement of snow pressure (originally density): When snow falls and the depth of the snow in 1 day has increased 5 cm or more, a supplementary measurement of snow pressure should be taken after depth of the snow is measured (or supplementary measurement).

Chapter XI. Hours of Sunshine

1. Definition of hours of sunshine (duration): The duration from the time the center of the sun appears on the horizon in the east of a locality to the time it reaches the horizon in the west and the sun's

direct rays are visible without any obstruction from ground objects, clouds, of fog is the potential hours of sunshine. The actual hours the sun shines upon a locality are called the hours of sunshine.

2. Names of sunshine recorder: Dark tube type, focal type. The old names were: Qiaotang type, Kangpeisituok type.

3. Name of chemical solutions: Ammonium ferrous citrate [2667]. The old name was: Ammonium ferrous citrate [2899].

4. Solution applicator: Absorbent cotton.

5. Requirement for application of chemical solution: ...Before applying chemical solution, absorbent cotton must first be used to clean the surface of the paper on which the solution is to be applied and which is used to record the sunshine (to remove the grease from the surface so that the paper absorbs the solution evenly). Absorbent cotton is dipped in the solution and applied on the paper. The solution should be applied thinly and evenly....

6. Procedures for recording sunshine: Sunshine paper that has been removed should be marked by pencil lines at the bottom according to the length of the photosensitive traces. Then the sunshine paper should be placed in sufficient amount of clean water to be soaked and bleached.... (Finally), the hours of sunshine of each hour should be computed according to the pencil lines....

7. Double-checking sunshine records after computation: Double-checking should be done by personnel on duty the next day.

Chapter XII. Amount of Evaporation

1. Method of measuring amount of evaporation using small-scale evaporator: When it is freezing, the weighing method is used. When it is not freezing, the measuring cup or the scale can be used.

2. Rain gage especially used to calculate evaporation: To calculate the amount of evaporation accurately during the rainy season, an additional rain gage should be set up especially for calculating evaporation.

3. Large-caliber evaporator: E-601 type evaporator with an aperture having an area of 3000 cm^2.

4. Items to be recorded for amount of evaporation of atmospheric table 1: Original amount, amount of rainfall, remaining amount, amount of evaporation.

Chapter XIII. Ground Temperature

1. Abbreviations for ground temperatures at different depths: Ground surface temperature, shallow layer ground temperature, and deeper layer ground temperature.

2. Area of ground section of bare ground surface and covered ground surface: 2 x 4 m^2 and 3 x 4 m^2 respectively.

3. Requirements of bare ground: The surface layer must be kept loose.

4. Observation of lowest temperature of ground surface at 0800 hours: Stations required to issue maps and reports should measure the lowest temperature of the ground surface at 0800 hours once when the lowest temperature of the ground surface may be ±5.0°C at 0800 hours.

5. Procedures for dealing with situation when indicator of ground temperature indicates temperature off the scale: The readings should be estimated by extrapolation and corrected values of the highest (lowest) temperature used in checks and proofs should be used to make corrections; parentheses should be added to the record (   ).

6. Procedures for handling situation when ground temperature thermometer of ground surface and bent tube type thermometer are under water: Measurements should be recorded as usual. If the 3 meters on the ground surface are floating in water, the records should be left blank and the situation should be noted in the remarks column.

7. Procedures for handling situation when bent tube ground temperature thermometer is covered by snow: In areas where the accumulation of snow is relatively shallow or the time of accumulation of snow is relatively short, the snow can be removed and measurements taken (the snow should be removed only slightly, like a seam, to expose only the gradation lines). When the time of snow accumulation is longer and the accumulation of snow is deeper, measurements should cease.

8. Maintenance of the three thermometers on ground surface: (1) In the morning when the temperature rises, the lowest ground surface temperature is measured and recorded in the 0800 hour column of the log. The thermometer is retrieved after measurement and placed indoors or at a shaded place standing upright with its ball pointed downward; (2) After strong winds and thunderous rain, the positions of the three thermometers should be checked carefully; (3) When water has accumulated or when heavy rain has fallen, forks of bamboo or wood should be used to stabilize the thermometers to prevent them from floating.

9. Procedures for handling situation when bent tube type ground thermometer is frozen and broken in winter: ...when the nearby soil is frozen, all bent tube type ground thermometers should be retrieved. If needed, they may remain in the ground, but the supporting forks should be removed.

10. The cm straight tube ground thermometer: Canceled.

11. Depth of burial of straight tube type ground thermometer: After burying the casing, the center of the sensitive part of the thermometers should be an appropriate depth below the ground surface.

12. Measurements using straight tube ground thermometer during heavy rain: When taking measurements during heavy rain, rainwater should be prevented from entering the casing, and the taking of such measurements may be appropriately delayed.

Chapter XIV. Frozen Soil

1. Name of instrument: Frozen soil meter. It used to be called the Danilin frozen soil meter.

2. Water used in inner tubes of frozen soil meter: Ordinary water of the locality (river water, well water, tapwater).

3. Recording frozen layers: When there are two or more frozen layers, the upper and lower depths of each frozen layer should be determined and the layers should be logged from bottom to top order and recorded in the column titled frozen soil depth.

4. Procedures for recording depth of frozen layer when lower limit of frozen layer is beyond the greatest graduation of the instrument: The numerical value of the greatest graduation is recorded and the symbol > is added. The following year, a longer frozen soil meter should be used.

5. Maintenance: (1) In areas where the frozen depth is relatively deep, a hanger can be set up for use in raising the inner tube during measurements; (2) After the period of frozen soil has ended, the water in the inner tube should be removed. The tube should be dried, and it should be taken indoors for safekeeping; (3) If the inner tube leaks or its chain (copper wire or string) is not fastened tightly, it should be repaired.

Chapter XV. Accumulation of Ice on Powerlines

1. Measurement of accumulation of ice on powerlines: To be incorporated into Chapter 15 of the standard instructions.

2. Name and structure of measuring frame: It is called the ice accumulation frame. It consists of two supports. Each group of supports consists of two pieces of angle steel. Two guidelines are hung across the two supports. The bottom guideline is 160 cm above ground. The two groups of supports are not connected. They are separated at an appropriate distance. The project is at a 90 degree angle.

At stations where the accumulation of ice is relatively heavy and two groups of supports are not sufficient, two additional groups of supports can be set up. At stations where the accumulation of ice is severe and normal freezing and accurate measurements of the ice layers on the top and bottom guidelines are being affected, several other groups of supports can be set up and the two guidelines across each group of supports can be converted to one guideline (the top guideline).

3. Types of accumulation of ice to be observed: Rain rime, soft rime, frozen objects of wet snow.

4. Standard for diameter of ice layer used to measure weight: (1) 15 mm for soft rime; (2) 8 mm for rainy rime, frozen objects of wet snow, or mixed accumulation of ice including soft rime.

5. Specification of folding box: The diameter is 15, 25, and 40 cm.

6. Tools for measuring weight of accumulated ice: Milliliter measuring cup and scale.

7. Function of guideline: The functions of the top and bottom guidelines are the same. They are used to observe and measure ice accumulation.

8. Measuring greatest diameter, thickness, and weight of one accumulation of snow: When there is a measurable amount of accumulation of ice, and it is estimated that the accumulation of ice has reached its maximum, the greatest values of these items should be measured when the opportunity arises. The guidelines are replaced, and at the same time the atmospheric temperature, wind direction, and wind speed should be recorded.

9. Method of taking accumulated ice: Generally a folding box is used to take samples (in combination with appropriate tools). But at places where ice accumulation is severe and it is very difficult to remove the guideline, or when the diameter of the accumulated ice has already surpassed the diameter of the folding box, the ice layers can be scraped directly off the guideline.

10. Recording process of accumulation of ice: The symbols ∾ (for rainy rime and frozen objects of wet snow) and V (for soft rime) are used to record times of formation and disappearance. The record should use 2000 hours as the end of day. In the old regulations, the end of day was 0 hours.

11. The log (table): The record is logged in the observation log (Atmospheric log 1) under the column "accumulation of ice on powerlines."

Chapter XVI. Monthly Report

1. Types of monthly reports: The original atmospheric report forms 1, 5, 6, 8 and monthly briefs are combined into atmospheric report 1.

2. Use ink to fill out form: Black or blue-black ink.

3. Name of station: The name of the unit of the station must be filled in. If the station is not designated by the name of a county (city), the name of the county (city) should be added in front of the name of the station.

4. Area station number and file number: Should be filled in.

5. Altitude above sea level of field of observation: When actually measured, it need not be filled in. If not actually measured, parentheses should be added to the altitude "( )."

6. Height of wind sensitive portion from ground: The height (platform) of the portion sensitive to wind velocity should be filled in.

7. Height of observation platform from the ground: The height of the observation platform (or top of the surrounding wall) from the ground.

8. Signature of observer and dates of mailing, inquiries, and revision: Canceled.

9. Dates of lunar calendar: Must be filled in.

10. Highest and lowest atmospheric pressure of the day and month: Stations with automatic recording instruments should record the extreme values of the day and the month as recorded by the automatic recording instrument. Stations are not equipped with an automatic recording instrument. Stations not equipped with an automatic recording device should leave blank the column for highest and lowest values of the day. The monthly highest and lowest values should be taken from the records of fixed time observations, and an asterisk "*" should be added.

11. Atmospheric pressure on ocean surface: Meteorological observatories (or stations) in the capital and in the capitals of each province (city, autonomous region) that are under orders from the Central Meteorological Bureau to issue four maps and reports in which the item of atmospheric pressure on the ocean surface is included shall record such pressure. (If the elevation from sea level of the mercury trough of the barometer is lower than 15 m, such pressure need not be recorded, but the corrective value for the altitude difference should be noted at the beginning of the column on the log.) The atmospheric pressure is recorded at a fixed time, and daily statistics must be compiled.

12. Method of selecting highest and lowest temperatures of the day: These should be selected from the highest and lowest temperatures of the day and the temperatures should be recorded at fixed times during weather observations (not including temperature readings used to assist mapping and reporting and observed for aviation reports, and not including the temperatures at 2000 hours the previous day).

13. Seasonal average temperature: Statistics must be compiled.

14. Temperature of wet ball thermometer: Fixed time records should be copied.

15. Smallest relative wetness of the day and month: Stations with automatic recording instruments should select the smallest values of the day and the month from automatically recorded records. Stations that do not have automatic recording instruments should leave the smallest daily value blank, take the smallest monthly value from records of fixed time observations, and add an asterisk "*."

16. Items and requirements: Dew point temperature daily fixed time records should be copied but not converted into statistics. Saturation differences are eliminated.

17. Amount of clouds and number of days: The daily average amount of clouds measured separately is designated 0.0-1.9, 2.0-8.0, and 8.1-10.0. In the old regulations, the number of days of sunshine was statistically derived, based on a total of 4 daily measurements of 0-7, and overcast days of 33-40. (The scale for stations where observations are made 3 times is 0-5, 25-30.)

18. Actually measured altitude of clouds: The type of clouds (including Fc, Fs, Fn) and the altitude of clouds must be noted.

19. Number of occurrences of visibility: "This is statistically derived in distances of 0.0-0.9, 1.0-1.9, 2.0-3.9, 4.0-9.9, and 10.0 km. In the old regulations, it was derived statistically in distances of 0-3, 4-6, and 7-9.

20. Amount of daily rainfall (total column): Notation of the substance of rainfall at upper right corner is canceled.

21. Amount of seasonal rainfall: Statistics should be compiled.

22. Amount of rainfall in a 10-day period and in a month: If there is no rainfall for the entire 10-day period or the entire month, the 10-day and monthly totals columns are left blank. In the old regulations, 0.0 was filled in.

23. Greatest amount of rainfall in a day, and date of occurrence: When there is no rainfall for the entire month, the amount and date columns are left blank. In the old regulations, 0.0 was written in the amount column.

24. Longest number of days of continuous rainfall, the amount, and the beginning and ending dates: When there is no rainfall for the entire month or when there is only a slight amount of rainfall, all columns are left blank.

25. Method of filling out beginning and ending dates of the longest continuous rainfall and the number of days without rainfall: Write x - x or write x/x - x when the duration extends from 1 month to the next. When such occurrence appears three or more times, the number of times is noted in the beginning and ending dates column. For example: 3 times.

26. Extreme values of the day and month, and number of hours of rainfall automatically recorded by automatic recorder of amount of rainfall: Canceled.

27. Rainy days, snowy days: (1) All days of rain, showers, and drizzle are statistically counted as rainy days; (2) All days of snow, snow showers, graupel, rice-like snow, ice pellets, and snowstorms are statistically counted as snow days (days of snowstorm must also be recorded statistically as days of blowing snow); (3) When rain mixed with snow and showers of rain mixed with snow occur, the days on which they occur are noted statistically as both a rainy day and a snow day. In the old regulations, only amounts ≥ 0.1 mm were noted as rainy days or snow days.

28. Abstracts of synoptic phenomena: The order of logging under the day's synoptic phenomena column must be followed, the standard method of writing the abstract must be followed, and the symbols must be entered.

29. Icicles, light fog, tornadoes, freezing, dust whirlwinds, lightning, polar light, and days of windstorms: All must be statistically recorded.

30. Amount of evaporation: Small-scale, E-601 type records.

31. Accumulation of snow: Depth of snow, snow pressure, and the greatest depth of snow and snow pressure in the month. In the old regulations, the greatest snow pressure of the month was not statistically recorded.

32. Accumulation of ice on powerlines: The greatest diameter, thickness, and weight of accumulated ice during the course of accumulation on the guidelines in two directions, and the temperature, wind direction, and wind velocity during the time of measuring the ice accumulation are to be recorded. The greatest monthly values are to be selected.

33. Greatest wind velocity of the month, and date of occurrence of wind direction: These are recorded under two columns of automatic records and

fixed time records. Stations with automatic recording devices shall select the values from such automatic records. The greatest wind velocity recorded automatically is entered in the greatest wind velocity column, and the column for greatest wind speed at fixed times is left blank. Stations not equipped with automatic recording devices shall select the values from the fixed time records. They shall be recorded under the column for the greatest wind velocity at fixed times. An asterisk "*" shall be added at the upper right corner of the wind velocity, and the column for automatically recorded greatest wind velocity column shall be left blank.

34. Wind statistics: Only one item, the "number of times of occurrence," is statistically recorded in C. In the old regulations, the "wind speed total" also had to be statistically recorded.

35. Highest and lowest temperature on ground surface: These are to be taken from the highest and lowest temperatures at the ground surface during the day and the ground surface temperatures at each fixed time.

36. Depth of frozen soil: The upper and lower boundary depths are recorded from the bottom frozen layer to the top frozen layer, in that order.

37. Number of days of sunshine: Must be statistically recorded.

38. Name of columns: The original special notation column has been changed to general description column.

39. Beginning and ending dates of frost, snow, accumulation of snow, and thunderstorm: Canceled.

40. General description of the month's synoptic and weather situation: Information of the station and related material shall be combined for a comprehensive analysis.

41. Column for listing instruments presently being used: Canceled. Replaced instruments shall be noted in the remarks column.

42. Simplified statistical forms for recording number of times of occurrence and number of days of occurrence of each item: If none has occurred throughout the entire month, the forms shall be left blank.

43. Statistical method for recording monthly averages in the daily total and daily average columns: These should be filled in vertically as statistics. This means, the monthly averages of the daily total columns are obtained by dividing the monthly total values of the daily total columns by the number of days of the month. The monthly average values of the daily average columns are obtained by dividing the monthly total values of the daily average columns by the number of days of that month. In the old regulations, these statistics were obtained horizontally.

44. Recording at 0200 hours at stations required to conduct observations three times: Water vapor pressure and dew point temperatures are obtained by checking back to find the automatically recorded temperatures and automatically recorded relative humidity. The method of checking back has been standardized.

When the wind direction and wind velocity are automatically recorded by instruments, the records for 0200 hours are replaced by such automatic records. (Use the average wind velocity and the most frequent wind direction within a 10-minute period of the automatic records as substitutes. Wind velocity is noted in whole numbers. The decimals are rounded off. If the wind velocity becomes zero after rounding, the corresponding wind direction should be noted as "C".) The daily total and the averages column should be statistically calculated based on four entries. Stations not equipped with an automatic recording device should leave the 0200 hours column blank. The daily total and averages column should be statistically calculated using the entries made at 0800 hours, 1400 hours and 2000 hours.

Ground surface temperature is replaced by 1/2 (the lowest ground surface temperature of the day + the ground surface temperature of the previous day taken at 2000 hours).

Ground temperatures at 15 cm, 20 cm, and 40 cm are not replaced by measurements taken at 0800 hours but are obtained statistically on a daily basis using 3 entries.

45. Statistical method for calculating the number of days of synoptic phenomena based on 3 (or 4) measurements taken at stations without night-time personnel on duty: Synoptic phenomena occurring at night (2000 hours to 0800 hours) should be included in the statistics for the number of days of synoptic phenomena.

46. Method of compiling monthly report on pressure, temperature, and humidity recorded automatically: These are included in Appendix 11 (to be decided separately by the provincial, region, and county meteorological bureaus and stations).

Chapter XVII. Annual Report

1. Types of annual reports: Atmospheric report forms 21, 25 and simplified annual report forms are combined into atmospheric report form 21.

2. Cover information: (Same as monthly report).

3. Time of reporting: Before the end of March.

4. Monthly average values at each time for items of average values: Compiled.

5. Highest and lowest monthly and annual averages and highest and lowest extreme atmospheric pressure, and atmospheric pressure at the ocean surface: Recorded and statistically calculated (atmospheric pressure at the ocean surface is required for only certain stations).

6. Seasonal and 10-day averages of temperature and amount of rainfall: To be recorded.

7. Method of filling in the smallest relative humidity and greatest wind velocity of the month, selected from fixed time records: When these are selected from fixed time records of individual months, an asterisk "*" is placed at the upper right corner of the extreme value. When all of these are taken from the fixed time record of each month throughout the year, an asterisk "*" is added at the upper right corner of each month's extreme values.

8. Items and requirements: Dew point temperatures are not included in the statistics.

9. Snow pressure (originally density of accumulated snow): The greatest snow pressure of the month is recorded and the greatest value of the year is selected.

10. Accumulation of ice on powerlines: The greatest diameter, thickness, and weight of one accumulation of ice in a month on the guidelines of two directions are recorded, as well as the temperature, wind direction, windspeed, symbols of the phenomena, and dates at the time these measurements were taken. The greatest value for the year is also selected. In the old regulations, these were reported once a year and no annual report was required.

11. Icicles, light fog, tornadoes, freezing, dusty whirlwinds, lightning, polar light, number of days of windstorms: Monthly values are recorded and annual statistics are compiled.

12. Amount of evaporation: Small-scale, E-601 type.

13. Greatest amount of annual rainfall for each time frame and date of occurrence: A total of 15 different time frames are selected, from 5 minutes to 1,440 minutes, for the greatest annual amount of rainfall and the beginning times. The greatest amount of one continuous occurrence is eliminated. In the old regulations, the 4 extreme values of the greatest amount of rainfall of 1 continuous occurrence of 10 minutes, 1 hour, and 24 hours were selected.

14. Beginning and ending dates of frost, snow, accumulation of snow, and thunderstorms: Selected from the abstract column of synoptic phenomena of atmospheric form 1.

15. Beginning and ending dates of freezing, lowest temperature ≤0.0°C, the lowest ground surface temperature ≤0.0°C: Selected and filled in on the form.

16. Method of selecting beginning and ending dates of critical temperatures of frost, snow, accumulation of snow, and freezing in cold regions at high altitudes: These are not limited by the fiscal year (30 June). The longest period in number of days of a continuous period of frostless and snowless days within the warm season should be selected to determine the ending date of the last fiscal year and the beginning date of this fiscal year. In the old regulations, selection was made according to fiscal years.

17. Statistical calculation of the number of days between beginning and ending times of synoptic phenomena and critical temperatures: These are statistically calculated and recorded (with reference table for checking attached).

18. Statistical method for calculating the number of days of frostless period: This is the number of days from the day following the day on which the frost ends in the first fiscal year to the day prior to the day on which the frost begins in this fiscal year. When filling in the form statistically, only the number of days within this year is statistically counted (there are four ways of counting). Thus, the maximum number of days statistically counted is 365 days (366 days in a leap year).

19. Method of filling in dates of occurrence and beginning and ending dates of extreme values of the year: The dates of occurrence are written as x/x; the beginning and the ending dates are written as x - x/x or x/x - x/x.

20. Wind statistics: An additional column is added for the total of wind velocities for each wind direction, and the number of occurrences.

21. Highest and lowest average ground surface temperatures: These are recorded and annual statistics are compiled.

22. Number of days of frozen soil: Canceled.

23. Number of days of sunshine in a month, and number of hours of sunshine within a 10-day period: These are recorded, and the number of days of sunshine in a year is statistically recorded.

24. Statistical method used when there are three or four records a year: The atmospheric pressure, amount of clouds, wind velocity, and wind statistics columns are combined as annual statistics. In the old regulations, atmospheric pressure, amount of clouds, and wind velocity were not included in the annual statistics of the records of 0200 hours and the averages column. The wind statistics column was used only to select the greatest annual wind speed of each wind direction.

25. Statistical records of a station before and after moving to a new locality: A new regulation is added for different ways to handle moves within 50 km or over 50 km of horizontal distance between two localities.

26. Method of revising differences in altitude of atmospheric pressure at one station: Regulations are issued for different methods of handling under different situations, and the method of correction is given in Appendix 9.

27. General situation of annual synoptic and weather conditions: This is a composite of the synoptic and weather conditions of each month and related information.

Chapter XVIII. Handling of Abnormal Records and Statistics

Methods for Handling Incomplete Records

1. Chapter arrangement: Included as Chapter 18 of Volume 3.

2. Time limits and methods of handling records of late measurements, early measurements and supplementary measurements: All items being automatically recorded by the automatic recording device should be used as substitutes. When an automatic recording device is not available, the original late measurements or early measurements should be used (in parentheses). The time limits for early measurements, late measurements, and supplementary measurements are 1 hour or within 1 hour of 0200 hours, 0800 hours, 1400 hours, and 2000 hours 00 minutes.

3. Procedures for handling the situation when automatic records fail to record measurements at 0200 hours at observation stations required to make three measurements: Use the automatically recorded measurements nearest the normal recording point and within 10 minutes prior to and following the normal point of recording (for wind direction and wind velocity, take the recording within 20 minutes prior to the normal recording point and 10 minutes following it). If automatic recording devices are not available, the situation should be handled by statistical methods and the reports should be filled out according to the regulations that pertain to the situation whereby no automatic recording device is available.

4. Method of handling the situation when beginning and ending times of synoptic phenomena are not recorded: Only the beginning of ending time is recorded. When both the beginning and ending times are missing, only the symbols for the phenomena are noted. The beginning and ending times of rainfall in liquid form should be substituted by the automatically recorded times. In the old regulations, the phenomena symbols were followed by a minus sign "-."

5. Method of handling the situation when automatically recorded measurements of wind direction and wind speed are missing: First, use the automatically recorded measurements of other winds as substitute. If there

is none, then use the recorded measurements of the minute nearest the normal point of measurement between 20 minutes prior to the normal point of measurement and 10 minutes following the normal point of measurement as a substitute. If there is none, the situation is handled according to regulations governing missing measurements.

6. Method of handling the situation when number of hours of sunshine is lacking for the entire day: When the entire day was overcast and rainy, write 0.0. When there were no clouds throughout the entire day, the total number of hours of sunshine of a certain day before (or after) the given day can be used as reference. Parentheses "( )" should be added. When the day was overcast and clear off and on, it should be treated as a missing measurement.

7. Method of handling the situation when records of highest and lowest temperatures of the day are lacking: Substitute the automatically recorded highest and lowest values. If there is none, or if the automatically recorded measurements are also lacking, then select the values from the fixed time records and add an asterisk "*."

8. Method of handling the situation when highest and lowest ground surface temperature of the day is lacking: Select such values from the fixed time records and add an asterisk "*."

9. Method of handling the situation when mercury column of thermometer is broken: Generally this is treated as a missing measurement. If the quality of the record is not affected greatly, the indicated degree minus the number of degrees in the broken-off section would give an approximate reading. Parentheses "( )" are then added.

10. Statistical method to be used when one or more fixed time recording during a day is missing: All average value items are to be written as daily totals without recording daily averages. The rest of the time records of that day are included in the 10-day and monthly statistics of each measurement.

11. Statistical method for handling missing measurements in seasonal records: When only one temperature measurement at a fixed time is lacking, the rest of the recorded measurements are used statistically. When two or more measurements are lacking, seasonal statistics are not compiled. When only 1 day's measurement of rainfall is lacking, the rest of the actual measurements are used for the statistics. When two or more measurements are missing, seasonal statistics are not compiled.

12. Method of handling 10-day statistical values when 3 or more fixed time measurements are missing: The 10-day statistics for that 10-day period will not be made, but when monthly statistics for that month are required, 10-day totals of fixed times and daily totals columns of those 10 days should be calculated.

13. Method of compiling monthly statistics when records are missing: When records of a certain fixed time lack an average of six measurements or less, the actual records are used for the monthly statistics. When seven or more measurements are missing, monthly statistics are not compiled. When the total amounts lack six measurement or less, the actual records are used for the monthly statistics. When seven or more measurements are missing, monthly statistics are not compiled.

14. Regulations concerning the adding of parentheses "(   )" to annual statistics: According to the method of handling the number of times (days) of missing measurements, the annual statistics should not require the addition of any parentheses "(   )." According to the method of handling the effect of missing measurements, there are regulations concerning the addition of parentheses "(   )." (listed separately)

15. Method of handling daily extreme values when automatic records of relative humidity and wind in a day are partially missing: When it is determined that there will be no ill effects, the daily extreme values can be selected normally. When it cannot be determined whether there will be any effect upon the statistics, of if it is determined that there will be an effect upon the statistics, parentheses "(   )" should qualify the daily extreme value when there is a possibility that this daily extreme value may be the extreme value of the month, or when the daily extreme value selected from the actual records is useful. When the selected extreme value does not have any usefulness, or when it is not as large (or small) as the extreme value chosen from the fixed time records, then the smallest relative humidity should be selected from the fixed time records, and an asterisk "*" should be added at the upper right corner of the extreme value. But the greatest and maximum daily wind velocity should be considered as missing measurements.

16. Method of handling monthly extreme values when records are missing: When it has been determined that the monthly extreme value selected from the actual records would not occur during the period for which measurements are missing, parentheses "(   )" are not used to qualify the extreme value. When it cannot be determined whether the monthly value occurred during the period for which measurements are missing, when there is the possibility that this may be chosen as the annual extreme value although it has been determined that this value occurred during the current period for which measurements are missing, or when the monthly extreme value selected from the actual record is still useful, the parentheses "(   )" are used to qualify this monthly extreme value. When the missing records affect the monthly extreme value greatly, or when the selected extreme values are no longer useful, the month's extreme value is regarded as a missing measurement.

17. Method of handling annual extreme values when measurements are missing: The method of handling this is the same as that for handling the monthly extreme values.

18. Regulations concerning addition of parentheses "(   )" to qualify statistical values when records are missing: Parentheses "(   )" should be added to related statistics when the number of missing measurements (days) is more than half the number of missing measurement (days) of the season, the 10-day period, and the month allowed by the regulations to be included in compiling statistics.

19. Statistical method to be used when automatic wind speed measurements are missing: When five or fewer wind velocity measurements of each fixed hour during the day are missing, the daily statistics are compiled according to the actually recorded measurements. When six or more measurements are missing, the daily total is computed but a daily average is not calculated. The remaining records of each fixed hour of that day are used to compile the monthly statistics for each fixed hour. During 1 month when a lack of six or fewer measurements at a particilar hour occurs, the actually recorded measurements are used for the monthly statistics. When seven or more measurements are missing at that particular hour, only a monthly total is computed and the monthly average is not calculated.

20. Statistical method of counting the number of times and the number of days in the month of the year when records are missing: When records are missing and monthly and annual statistics are still required, the number of times and the number of days in the month or year are still computed statistically. When the monthly and annual values are qualified by parentheses "(   )," the number of days and the number of times must also be qualified by parentheses "(   )." When the monthly and annual values are treated as missing measurements, the number of days and the number of times are also treated as missing measurements.

21. Method of handling daily, seasonal, 10-day period, monthly and annual statistics according to the effect of the missing measurements: When the effect upon the average values ≤ ±0.3, no parentheses "(   )" are added; ±0.4 - ±0.6, parentheses "(   )" are added; ≥ ±0.7, they are treated as missing measurements. When the effect upon the total values ≤ ±10 percent, no parentheses "(   )" are added; ±11 percent - ±20 percent, or beyond ±20 percent but the values are still useful, parentheses "(   )" are added; ≥ ±21 percent, or smaller than ±21 percent but there is no usefulness, they are treated as missing measurements.

22. Effect of missing measurements upon concerned statistics: Included in Appendix 10.

9296
CSO: 4007

BRIEFS

HOG DISEASE TREATED WITH LASER--Two instructors at the Southwest College of Nationalities have successfully used carbon dioxide laser beams to treat white scours disease among young pigs. This is done by directing the beam at an acupuncture point located between the base of the tail and the anus of a sick pig. This was the first time that this technique was used successfully in China. According to observations on 25 sick pigs treated by this technique, the rate of cure after only one treatment was 92.2 percent. [Summary] [Chengdu SICHUAN RIBAO in Chinese 15 May 80 p 1]

CSO: 4007

BRIEFS

SUSONG EARLY RICE--Some 270,000 mu of early rice are being harvested in Anhui's Susong County. As of 22 July, 54,000 mu of early rice were harvested and 32,000 mu of late rice transplanted. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 23 Jul 80 OW]

CSO: 4007

FUJIAN

BRIEFS

RAISING OF SUGARCANE--Fuzhou, 4 Aug--Fujian Province has vigorously developed sugar production by fully availing itself of favorable local conditions. The province's total sugarcane growing area now has reached 670,000 mu. There are 51 mechanized and semimechanized sugar plants with a total daily sugarcane processing capacity of 27,000 dun. During the 1979-80 sugar producing season, the province produced 371,000 dun of sugar against 110,000 dun 4 years ago. [OW052349 Beijing XINHUA Domestic Service in Chinese 0803 GMT 4 Aug 80 OW]

RAPE PRODUCTION--Fuzhou 25 Jul--The Fujian Provincial CCP Committee plans to fully develop rape production this winter in an effort to solve the province's shortage of edible oil. Due to the influence of the ultra-leftist line of Lin Biao and the gang, the province's rape acreage steadily decreased in the past although it had about 5 million mu of idle land in the winter suitable for growing rape. The committee decided that except for those areas with fairly large wheat output all localities should stress the growing of rape. [OW290931 Beijing XINHUA Domestic Service in Chinese 0729 GMT 25 Jul 80 OW]

AZOLLA CULTIVATION INCREASED--The cultivation of azolla in Fujian Province during last spring yielded the best result in many years. Currently this province has 152,000 mu of azolla farms. Estimates made by departments concerned indicated that over 1 million mu of azolla would be available prior to the transplanting of early rice, a record acreage for this province. The cultivation of more azolla in paddy fields is an important measure to increase rice output in Fujian this year. [Summary] [Beijing RENMIN RIBAO in Chinese 4 Jun 80 p 4]

CSO: 4007

HUGE AREA OF RECLAIMABLE LAND FOUND IN GANSU CORRIDOR

Beijing GUANGMING RIBAO in Chinese 8 Jun 80 p 1

[Article by Gu Yonggao [7357 3057 7559]: "Results of Resources Investigation of the West-Central Wasteland of the Hexi [west of Huanghe] Corridor"]

[Text] The Gansu Provincial Bureau of Agriculture and Land Reclamation Wasteland Resources Investigation Team worked very hard for a year to complete the job of investigating the 230,000 square kilometers of wasteland in the west-central part of the Hexi corridor. They have clarified the fact that this region has over 1,600 mu of wasteland and have written a report of 250,000 characters, with 18 maps depicting various type of resources there, to provide a scientific basis for the reasonable development of that area to construct a basis of commercial grains.

The area of the Hexi corridor is extensive. It is an important area of land reclamation as well as one of the 12 commercial grain production bases of the country. It has been the wish of the state and the people of Gansu to transform this vast area into a granary through clarification and reasonable utilization of the wasteland resources. The Wasteland Resources Investigation Group set forth in April 1979 to proceed with a detailed and comprehensive investigation of the wasteland, forests, grassland, wasteland soil, agricultural climate, water resources, agricultural and animal husbandry production, and condition of utilization of the water and soil resources of the 13 agricultural and animal husbandry counties of the west-central party of the Hexi corridor.

This comprehensive investigation has provided the knowledge that in this area (except for the three purely animal husbandry counties), of the 160 million mu of wasteland, more than 4.5 million mu are arable. This is equal to the total amount of existing cropland in the two districts and one city in the west-central part. The rest of the wasteland may also be used for forestation and grazing. As a result of its analysis and study, the investigation group believes that the basic characteristics of the wasteland in that area are its concentrated distribution, vast acreage, contiguous land, and flat terrain. Most of it is located along the inland river valley; therefore, with required engineering measures, irrigation is available. Furthermore, the lighting conditions are excellent. The total amount of solar radiation is among the highest in China. It is a very suitable area for planting grain, cotton, oil, and flax crops.

6168
CSO: 4007

DECISION TO DEVELOP AQUATIC PRODUCTION EXPLAINED

Guangzhou NANFANG RIBAO in Chinese 16 Apr 80 p 1

[Article by staff commentator: "Rely on Policy To Develop Aquatic Production"]

[Text] To fully utilize our province's presently available massive amount of water surface and beaches for the development of aquatic production, the Guangdong Provincial Committee of the Chinese Communist Party and the Guangdong Provincial People's Government recently announced a decision to develop aquatic production in a big way (abbreviated the "decision" hereafter) and issued concrete rules regarding many policy questions. It realizes the spirit of the Third Plenum and the spirit of the two documents on agriculture in our province's actual situation and reflects the wishes of the broad masses. It will exert an important effect in pushing forward efforts to hasten the development of aquatic production.

The natural conditions for the development of aquatic production in our province are quite superior. The entire province has over 4,000 kilometers of coastline, and the area of shallow seas and beaches suitable for cultivation total over 1.7 million mu. There are also over 19 million mu of inland rivers and water surface. But this water surface and these beaches have not yet been fully utilized. At present, the area of seawater fish culture throughout the province is only 270,000 mu. The area of freshwater fish culture is only a bit over 3 million mu. Massive amounts of water surface and beaches are left uncultivated. To utilize them, the enthusiasm of the state, the collective, and the commune members needs to be effective early. Relying solely on the state's limited financial and material resources will not work. Therefore, the "decision" emphasized that while straightening out the state piscaries and building commercial aquatic product bases, "it is imperatively important to vigorously develop fish breeding in the communes and brigades." "Commune members must be encouraged to breed fish in their households through sideline production." The scattered water surface that is inconvenient for the communes and brigades to care for should be allocated, according to plan, to commune members for them to raise fish. Also, arrangements should be made for commune members to utilize the scattered wasteland of the five sides, according to plan, so that they can dig and build ponds to raise, consume, and sell fish on their own. In this way, the state, the collective, and the individual are all engaged in raising fish, the potential can be fully exploited, and aquatic production can realize greater, faster, better and more economical results. The experience of many advanced communes and brigades of our province proves that developing aquatic production reaps many benefits, the cost is low, the results are quick, and it is an important way for the broad masses of farmers to become rich.

Aquatic production is production that is highly technical. Under the present conditions, equipment generally is scattered or operated by hand. Therefore, to vigorously develop collective aquatic production, a system of production responsibility corresponding to the level of realization of the commune members at the present stage and the production characteristics described above must be implemented within the production brigades. The principle of distribution according to work must be truly realized so that the good or bad points of aquatic production and the economic benefits of management personnel are directly tied together. In particular, commune members who have a lot of experience in raising fish should be given appropriate pay so that they will utilize their talents and contribute more to the collective. Since last year, many places in our province have implemented the production responsibility system of "several established goals and one reward." In some cases, responsibility for fishponds were borne by the unit or the individual (including the use of "bidding"), and all achieved increased production. This paper's story about large-scale increases in fishpond production realized by the Fuchang Commune in Yanjiang County is a case in point. This commune's Shanwaidong Brigade has a place called Jiaoziwei, where the fishponds produced only 3,000 yuan worth of products in past years. Last year, their management was contracted to six experienced commune members, and the yield greatly increased, surpassing the goal of 14,000 yuan. The production responsibility system described above is effective and has been confirmed and promoted by the "decision." We hope that each locality, in the course of propagating the responsibility system, will pay attention to the actual situation and ceaselessly summarize their experiences so that perfection can be gradually achieved and efforts can be exerted to create new results and raise the management level of aquatic production operations.

The correct handling of the proportion of procurements and retention of aquatic products also affects the important question concerning the mobilization of the enthusiasm of production units for aquatic production. In the past, due to the interference of the extreme leftist line of Lin Biao and the "gang of four," there were yearly increases in assigned procurements, surplus production was required, the portion retained by the production units was too small, and even units with high yields and a lot of surplus yield did not receive the appropriate attention. This way of doing things hurt the enthusiasm of the production units; it actually was "whipping the fast water buffalo," encouraging low production. In view of this situation, the "decision" reemphasized that "the task of procuring pond fish in the old bases will remain unchanged for 3 years. Products outside the plans can be dealt with by the producers themselves," and it stipulated that "procurement in the new commodity bases...will not exceed 50 percent of their output for 3 years." Products of noncommercial bases and of fish culture farms expanded by the commune brigades' own efforts will not be procured. In this way, the proportion of products retained by the production units can be expanded, the income of the collective and the commune members can be increased, and the benefits of the state, the collective, and the individual can all be better taken care of. The amount of products to be retained by high-yielding production units is greater than that for others, and benefits are greater. Thus, production units can be encouraged to manage more efficiently and to exert efforts to increase production.

The "decision" also pointed out: "Beginning this year, a portion of the foreign exchange of the province and the localities will be appropriately arranged to support freshwater fish culture, to be used for importing machinery for digging ponds, feed and fishery materials." Certain export-oriented superior quality aquatic products can be procured at high prices based upon international market prices. These regulations benefit the expansion of exports of aquatic products, increase foreign exchange earnings, and create better material conditions for developing aquatic production.

Development of aquatic production depends upon policy. The potential of the policy is great. The power of the policy is great. We hope that each concerned department will rapidly and in an overall way implement the policy and strive for continued large increases in aquatic production beginning this year.

9296
CSO: 4007

BRIEFS

HAINAN PEPPER--In the first half of 1980, the people in Hainan have raised an additional 4,500 mu of pepper, an increase of 73 percent over the corresponding period of last year. In Baoting County, 150,000 yuan was allocated from the local finance revenue to support the communes to develop pepper production. In the first half of this year, the people in this county have raised an additional 520 mu of pepper. This was an increase of 200 percent over the corresponding period of last year. In Wenchang, Wanning and Qionghai counties, the area sown to pepper has been increased to 10,000 mu. In Qionghai County, there are now 6,000 full-time technicians engaged in pepper production. [Haikou Hainan Island Service in Mandarin 0330 GMT 8 Jul 80 HK]

ANIMAL HUSBANDRY--In the first half of this year, the number of pigs in the province increased by 1.5 percent over the corresponding period of last year, cattle and goats increased by 200 percent, while chicken, geese and ducks increased by 100 percent. However, the collectively-raised pigs decreased by a large margin compared to the corresponding period of last year, while the privately-raised animals increased markedly. This is the result of implementing the rural economic policy. By the end of May, there were 4.1 million pigs with the privately-raised pigs accounting for 80 percent. There are more cattle and goats in Zhanjiang Prefecture, Hainan, North Guangdong and Huiyang Prefecture. At present, there are 2 million cattle throughout the province. In Qiongshan County in the first half of this year, there were 90,000 goats. In the past year, a number of good breed pigs and cattle have also been imported from abroad. [Guangzhou Guangdong Provincial Service in Mandarin 1120 GMT 26 Jul 80 HK]

CSO: 4007

BRIEFS

GRAIN CONFERENCE--The Guangxi Conference on Grain was held recently in Nanning. The participants reviewed the management of the grain enterprises in the first few months of this year. In accordance with the spirit of the Regional Conference on Financial Revenue, they studied and discussed the issues of further improving management, reaping a bumper harvest while reducing expenses and accumulating funds for the four modernizations. The participants revealed that the staff and workers of the grain departments have thoroughly grasped management techniques, reduced financial losses and increased profits. However, economic management is weak and waste is common. The conference adopted several measures to further improve the management of grain enterprises. The leadership at all levels must seriously grasp the need for education and must set up spare-time universities for the staff and workers. The grain departments can hold short-term training courses for technicians at all levels. During the conference, the regional grain bureau presented certificates of commendation to units and individuals who had made the most progress. A total of 300 persons took part in the conference. [Nanning Guangxi Regional Service in Mandarin 1130 GMT 27 Jun 80 HK]

LATE RICE--A GUANGXI RIBAO commentator's article said that it is necessary to plan for late rice production while making preparations for harvesting early rice. It pointed out that late rice production is becoming increasingly important throughout the process of rice production. According to statistics, from 1970 to 1979, the average mu yield of late rice throughout the region increased from 301 to 461 jin. The total output of late rice is more or less similar to early rice. Sometimes, the total output of late rice even exceeds that of early rice by 10 percent. Since spring this year, the northern part of the region experienced low temperatures and rain, while the south experienced drought. Transplanting of early rice was delayed by 7 to 10 days. During the tending of early rice, many areas were affected by low temperatures. Some areas even experienced hailstones and floods. According to weather forecasts, drought in some areas may worsen, while in other areas, there may be more rain. The article revealed that there is a shortage of labor and of agricultural machinery and tools. [Nanning Guangxi Regional Service in Mandarin 1130 GMT 27 Jun 80 HK]

SUMMER FARMING CIRCULAR--On 2 July, the Guangxi Regional CCP Committee and the Guangxi People's Government issued a circular on doing a serious job of summer reaping and sowing. The circular said that the maize-producing areas in the region have entered the busy season of summer reaping and sowing. The reaping of rice has also begun from the south to the north. It is necessary to study the situation in each of the localities, solve the technical problems in agriculture, respect the self-determination rights of the production teams, establish the system of production responsibility and cite the collectives and individuals who have done well in crash reaping and sowing. The circular revealed that since spring, the southern part of the region has experienced drought, while the northern part has experienced cold spells. As a result, some areas had delayed the harvesting of early rice. According to weather forecasts, "cold dew" [8 October] wind may arrive earlier. It is also necessary to apply sufficient organic manure to autumn maize, resist drought and prevent floods. [Nanning Guangxi Regional Service in Mandarin 1130 GMT 3 Jul 80 HK]

FISHING CONFERENCE--The first Guangxi ocean fishing management conference was recently held in Beihai Municipality. The participants further obtained a clearer picture of the central task of fishing management, studied the relevant issues on fishing management, summed up and reaffirmed the achievements of fishing management in Guangxi and analyzed the situation of marine resources along the coast of Guangxi. The participants decided to set up the Guangxi Fishing Management Department, while the counties and municipalities along the coast set up fishing management depots and the communes will have fishing management personnel. They pledged to implement the fishing management law and regulations. All fishing boats must be registered and inspected. In the future, all fishing boats must have permits before they are allowed to enter the fishing areas. [Nanning Guangxi Regional Service in Mandarin 1130 GMT 24 Jul 80 HK]

LIVESTOCK BREEDING--Since 1979, the Guangxi autonomous regional people's government has appropriated 19 million yuan to assist 33 mountainous counties in breeding cattle, sheep and honey bees. With the funds, these counties have bought some 42,800 head of cattle, some 26,000 sheep and 1,100 bee hives; they have also set up 995 collective cattle ranches, 287 sheep farms and 77 apiaries. Duan Yao Autonomous County is raising more than 300,000 goats, accounting for one-third of the total number of goats in Guangxi. [Beijing XINHUA Domestic Service in Chinese 0124 GMT 25 Jul 80 OW]

TYPHOON, FLOODING--Affected by a force-7 typhoon, Ningming County had rainstorms from 22 to 24 July with the water level in the river rising rapidly and floods spreading everywhere. Among 12 communes, highways in three were destroyed by floods and 280 houses were flooded, while 180 houses collapsed, 30,000 mu of farmland were flooded and the people's lives and property were seriously threatened. A certain PLA unit stationed at the border of the region has set up a leadership group for crash repairing dangerous sections and relieving the disaster and sent out leading cadres to lead work groups to take part in flood resistance and crash repairing of dangerous sections. After 25 July, the flood began to subside. [HK041230 Nanning Guangxi Regional Service in Mandarin 1130 GMT 31 Jul 80 HK]

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BRIEFS

GRAIN, OIL MARKETS--Recently, the Guizhou Provincial people's government issued a circular which demanded that the grain departments in various areas manage the markets of grain and edible oil well. Some 40 counties in the province have set up companies to purchase and market grain and edible oil in advance. The grain departments must closely coordinate with the industry and commerce departments. [Guiyang Guizhou Provincial Service in Mandarin 2315 GMT 25 Jul 80 HK]

CSO: 4007

HEBEI

AGRICULTURAL CONTRACTS PROMOTED IN SHIJIAZHUANG

Beijing RENMIN RIBAO in Chinese 24 May 80 p 1

[Article: "Shijiazhuang Prefecture's Promotion of Agricultural Contracts Proves Effective"]

[Excerpts] By adapting methods to the local conditions, Shijiazhuang Prefecture in Hebei Province is currently in the process of actively and reliably promoting the agricultural production contract system. State-owned enterprises and institutions, and production brigades in 15 of 17 counties in the prefecture, have signed contracts for various projects containing various agreements. Beginning in 1979, enterprises, institutions, communes, and brigades in Jin County in Hebei Province implemented a test contract for the fixed production and fixed purchase of grain and cotton, a partial agricultural means of production supply contract, and a contract to help market agricultural sideline commodities and native products--all of which have had outstanding success.

The Shijiazhuang Prefectural CCP Committee and the Shijiazhuang administrative office permitted the investigation unit of the prefectural financial operations organization to conduct an investigation in Jin County for almost a whole month. On the basis of the investigation, they concluded that there were numerous advantages to the contract system. It was beneficial not only to the completion of state purchase quotas for grain, cotton, and edible oils, but also in lightening the burden of the farmers. Furthermore, the rural village economies became livelier, as a result of which enterprises had more business to transact. In 1979, profits from the commercial system in Jin County increased by 500,000 yuan.

9432
CSO: 4007

HEILONGJIANG

REGIONAL PLANTING OF CROPS PROVES SUCCESSFUL

Beijing RENMIN RIBAO in Chinese 11 Jun 80 p 2

[Text] HSINHUASHE reporter Jing Bo [2529 0590] reports: In order to utilize its natural advantages, Heilongjiang Province has adopted the system of regionalization of crops to establish bases of production for grains, soybeans, local beans, sugar beets, flax, and oil-producing crops. Good results have been obtained.

This year, Heilongjiang summarized the crop regionalization experience of the previous 2 years and carried out a general survey of the soil, the weather, and water resources to proceed with revision of crop regionalization plans. The province was divided from north to south into six agricultural production regions. The Heihe area of the northernmost part of the province, the northern part of the Nenjiang area, and the area of Sanjiang plain where the temperature is low are designated suitable for spring wheat and soybeans as the major crop. The center of the Song-Nen Plain and the area of Hejiang, where some county-operated and state-operated farms are located, are primarily for cultivating corn, soybean, and rice. The state-operated farms in the eight counties of Nahe, Keshan, Hailun, and others should plant mainly soybeans, wheat, and corn. The 24 counties of Anda, Shaodong, Lindian, Fuyu, etc., are to be bases for sugar beets. The 11 counties of Baiquan, Yian, Gannan, Tailai, etc., are to be bases for such oil crops as sunflowers, castor oil plants, etc.

The practice of crop regionalization can develop the natural advantages of different regions as well as motivate a positive attitude toward production on the part of the cadres and members of the rural villages and the farm workers. This year the various regions of Heilongjiang have all been earnestly selecting and breeding early ripening and high-yield grain varieties to promote early maturing of crops.

In the process of practicing crop regionalization and adjusting the crop ratios, the various regions of the province have suitably increased the amount of high-yield grain crops as well as other crops that are selected for their high prices to bring greater income. The price of soybeans is relatively higher, while the local soil and climate of Qingan County are suitable for soybeans. Last year, the soybean acreage of that county was increased from over 100,000 mu to more than 400,000 mu. It has been further expanded to 500,000 mu, or one third of the total grain and bean acreage. Baiquan County is suitable for sunflower crops. This year, the county enlarged its sunflower acreage to 500,000 mu, amounting to 13 percent of its total cropland acreage.

6168
CSO: 4007

HEILONGJIANG

BRIEFS

FISH POLICY--Commercial departments in Heilongjiang Province have abolished the policy of assigned purchase prices for fresh water fish. Reservoirs, communes, brigades and individuals raising fish are now allowed to sell the fish on the market at negotiated prices. State-run fishing grounds are also allowed to sell their fish after fulfilling state assigned tasks. [Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 22 Jul 80 SK]

HARBIN LAND RECLAMATION--Since the beginning of 1980, Heilongjiang Province has reclaimed 610,000 mu of land for farming, sowing spring soybeans on some 250,000 mu of land. With the support of the state, this province has reclaimed more than 3.32 million mu of land during the 1978-1980 period. The Heilongjiang Provincial general state farm administration bureau is now drawing up a 5-year reclaimation plan and is planning to reclaim 10 million mu of land during the 1981-1985 period. [Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 24 Jul 80 SK]

HARBIN INSPECTS PESTS--Grass borer and armyworm pests in various localities throughout Heilongjiang Province basically have been brought under control. Measures are being taken to control corn borers, soybean pod borers and locusts. Beginning in mid-July, the province will apply two methods--agricultural pesticides and biological controls--to control and kill corn borers in 15 million mu of corn. Zhaodong and Anda counties are suffering from locusts. The appropriate authorities are dispatching planes to spray pesticides in order to control them. [SK112310 Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 10 Jul 80 SK]

CSO: 4007

UNDERGROUND GRANARIES SUCCESSFULLY BUILT IN HENAN

Beijing RENMIN RIBAO in Chinese 23 May 80 p 1

[Article: "Preliminary Success With Construction of Underground Granaries in Henan"]

[Text] HENAN RIBAO has reported that scientists, technicians, and workers on the grain front in Henan Province have scored initial successes in the construction and use of underground granaries, following 10 years of study and experience.

Beginning in 1965, the Henan Provincial Grain Department, and prefectural and municipal grain departments concerned, successfully test-built seven underground granaries in numerous configurations, following 4 years of effort. Now hundreds of underground granaries have been built, attracting the attention of the Food and Agriculture Organization of the United Nations.

Underground granaries are superior in numerous ways to granary buildings. Their construction cost is low, they save materials, and they occupy little land. Additionally, maintenance costs are low. In storage capacity, however, they are only about 10 percent that of granary buildings, and the minimum was only 1.5 percent. A third [advantage] is airtightness. Once an underground granary has been sealed shut, it becomes naturally anaerobic, which effectively controls damage resulting from insect pests and from the proliferation of various kinds of aerobic fungi and bacteria.

9432
CSO: 4007

BRIEFS

XINYANG PREFECTURE FLOOD--From 16 to 20 July, in central south of Xinyang Prefecture, there were heavy rains and storms. The rain occurred primarily in the southern parts of Shangcheng, Gushi, Xin, Huangchuan, Guangshan and Luoshan counties. The average level of rainfall was 200 mm. Large areas of farmland along the rivers were flooded. Some of the bridges and roads were destroyed, cutting off communications. On 19 July, (Liu Yizai), first secretary of the prefectural CCP committee, went to check the dam at the (Nanwan) reservoir. Through the efforts of the party, government and people, they have preliminarily overcome the flood. On 20 July, the prefectural CCP committee and the commissioner's office held a telephone conference, calling on the cadres and masses throughout the prefecture to launch production and disaster relief work to reduce the losses. [Zhengzhou Henan Provincial Service in Mandarin 1130 GMT 23 Jul 80 HK]

SUMMER GRAIN CONFERENCE--Recently, the Henan provincial people's government held a work conference on summer grain production to sum up and exchange experiences in wheat production this year and to discuss and formulate plans and measures for summer grain production next year. Cui Guanghua, vice provincial governor; (Li Yihuan), vice chairman of the Henan Agricultural Committee; and Dai Suli, vice provincial governor, gave summations of the conference. The participants reaffirmed the achievements in summer grain production of resisting natural disasters this year. They revealed that there were 62 million mu of wheat in the province which experienced winter waterlogging, spring drought, low temperatures and rain. [Zhengzhou Henan Provincial Service in Mandarin 1130 GMT 25 Jul 80 HK]

BUMPER HARVEST OF WHEAT--This year, the people in Xuchang Prefecture reaped a bumper harvest of wheat from 7 million mu. During wheat harvesting, rain fell continuously, causing decay to some of the wheat. However, the total and unit output still exceeded that of 1975, which was a record. The areas sown to wheat accounted for 70 percent of the total farmland in the prefecture. This year, the prefecture had concentrated funds and material on the communes and brigades whose output was medium and low. Since 1979, 26.41 million yuan of agricultural loans have been provided to these communes and brigades throughout the prefecture. Some 27,430 tons of chemical fertilizer were also provided to them. Since last year, the prefecture trained 770 county and commune leading cadres, while the county and communes trained 134,000 agricultural technological backbone elements for the brigades and production teams. [Zhengzhou Henan Provincial Service in Mandarin 1130 GMT 30 Jul 80 HK]

COTTON CONFERENCE--From 20 to 22 June, the Henan Provincial People's Government held an on-the-spot conference in Nanyang County on midseason cotton tending. The participants explored cotton tending problems and studied how to improve cotton tending methods. Liu Jie, general secretary of the Henan Provincial CCP Committee and provincial governor, attended the conference, listened to the opinions and gave an important speech. The participants revealed that the main problem was uneven development. There are 1.46 million mu of third grade seedlings in the province. However, there is a shortage of plant chemicals, machinery and funds. In some areas, the leadership is not strong enough, while in other areas, there are not enough full-time cotton-growing technicians. Liu Jie urged the participants to firmly grasp the situation and to improve management. He revealed that the key time for growing cotton is July, August and September, but that is also the time for natural disasters. The conference solved some practical problems in cotton growing. [Zhengzhou Henan Provincial Service in Mandarin 1130 GMT 27 Jun 80 HK]

CSO: 4007

HUBEI

COST ACCOUNTING ON AGRICULTURAL PRODUCTS RESUMED

Hubei Pilot Project

Beijing RENMIN RIBAO in Chinese 23 May 80 p 2

[Article by XINHUA correspondent, Sun Hongbin [1327 7703 2430]: "Good Results from Cost Accounting Pilot Project for Agricultural Products in Hubei"]

[Text] Last year, agriculture leadership units in Hubei Province conducted a cost accounting pilot project on agricultural production in 10 production brigades as a result of which the income of these brigades has increased, expenses reduced, and production costs lowered.

For a long time a situation of production with no accounting for costs, and investment with no concern for effectiveness has existed throughout the rural villages of Hubei, and expenditures of all kinds have been very high. In numerous brigades, production has increased without increases in income, and in some cases where production has increased, income has declined. In order to seek a solution, agricultural leadership units in Hubei last year selected 10 production brigades on the plains, in hilly areas, and in mountainous regions that differed in the nature of their work and their economy to conduct a pilot project in cost accounting for agricultural products.

Over the period of a year, the 10 pilot project brigades conscientiously calculated complete costs including expenditures for the means of production and expenditures for human labor. They set up categories on the basis of the real situation, making cost accountings for nine individual categories of crops, namely, paddy rice, cotton, wheat, millet, rape, sesame, potatoes, sweet potatoes, and corn. Other crops were lumped together for accounting purposes. The individual items accounted for in the production of each crop were: seeds, fertilizer, farm chemicals, work done by machines, draining and irrigation work, work done by draft animals, joint expenditures for agriculture, costs for care and other expenditures. Additionally, there was the cost of labor. Any direct production expenditures and uses of labor were directly recorded as costs of production for individual crops according to amounts used. All indirect production expenditures and uses of labor, plus actual expenditures at year's end, were apportioned in a reasonable way for each individual crop according to specific standards of apportionment. At the end of the year, complete costs for each crop were calculated. All this cost accounting data provided important data for all echelons of leadership in their study of pricing policies, in arranging agricultural patterns, and in launching campaigns of increased production and conservation. They also showed production teams how to increase their incomes, reduce expenditures, and lower production costs of agricultural products.

1. Cost accounting gave a pretty good idea of how to lower costs, increase income, and conserve on expenditures. With the institution of cost accounting, people clearly saw concrete ways in which they could save, make more sensible investments of funds, and gain the best economic results from the minimum expenditures. The gross income of these 10 production brigades increased by 25.2 percent last year. Expenses as a part of total income declined from the 32.7 percent of the previous year to 26.7 percent. Net income increased 36.7 percent over the previous year, and income distributed to commune members rose by 32.4 percent.

2. Enhanced and improved administration and management. For the past several years management of the communes and brigades in rural villages had been chaotic, but once cost accounting was implemented, these 10 brigades set up and improved upon their management systems. Expenditures for other than production and management expenses alone declined 31.2 percent and 30.1 percent respectively.

3. Gave impetus to the movement for scientific farming. Quite a few production brigades used to use fertilizer recklessly, applied agricultural chemicals with abandon, and used too many seeds, while frequently considering their actions to be sensible production expenditures. Once cost accounting had been instituted, every brigade examined results derived from techniques in conjunction with economic benefits derived. As a result, technicians gave attention to selection of the best methods of lowering production costs.

4. Grass roots level cadres have delved into economics. Brigade cadres have joined with the masses to analyze costs, to ferret out the main contradictions affecting the raising and lowering of costs, and have adopted measures accordingly to lower the production cost of commodities. They have also come to understand how profits and losses occur for the various agricultural commodities, and they have made suitable readjustments to their planting plans on the basis of these realities.

This cost accounting of agricultural products by the 10 production brigades and the benefits it has brought has aroused a very great reaction in Hubei Province. This year in Hubei Province, 334 basic accounting units have begun to make cost accountings of farm commodities, and 11 614 basic accounting units have instituted expenditure and cost accounting.

Commentary Noted

Beijing RENMIN RIBAO in Chinese 27 May 80 p 2

[Article: "Heartening Beginning"]

[Text] Cost accounting for farm products, which has been interrupted for so many years, has today been placed on the agenda once again and is beginning to be given serious attention. The pilot project conducted in 10 production brigades in Hubei achieved outstanding results in this regard. This is a heartening beginning.

The worst disaster visited upon agricultural problems by the ultra-leftist line was the destruction of administrative and management work in the people's communes. For a long time there has been no concern about the economic effectiveness of agricultural production with no cost accounting being done. Numerous places simply plunged headlong into pursuit of high grain output, caring not at all that production costs increased countless times over. As a result, "high production poor communes," and "high production poor brigades" appeared and the poverty of the broad masses went on forever. Increased production with increased income became impossible of achievement; the collective was poor and the peasants were poor too, with serious damage being done to the production initiative of the peasants. Many years experience have shown that when there is unhealthy management with no economic accounting, agriculture is not well run.

Cost accounting in production is a concentrated manifestation of economic activity in communes and brigades, and is a mirror on production. Good management of communes and brigades requires that cost accounting work be given a primary role. Only through cost accounting can we make comparisons of economic effectiveness and clearly see which things are worth doing and which are not, be able to do the most at the least cost, use the least investment to get the best economic results, increase agricultural accumulations, and improve the livelihood of the peasants.

Cost accounting is imperative. We are looking forward to more good experiences!

9632
CSO: 4007

HUBEI

NEW TYPE OF BOAT TRACTORS PROMOTED IN HUBEI

Beijing GUANGMING RIBAO in Chinese 26 May 80 p 2

[Article: "Hubei Province Promotes a New Type Mechanized Tilling Boat"]

[Text] The joint cooperation of the Honghu Machinery Plant, the Provincial Machinery Institute, the Hongan Machinery Plant, and the Wuhan Technical Institute in Hubei Province has recently resulted in the successful test manufacturing of a new type mechanized tilling boat with special applications in our country--the Hubei Model 12 tilling boat. This tilling boat is equipped with a 12 horsepower diesel engine. Double-shared plows, tilling machines, and wooden rollers for working the fields may be fitted to these boats by using special fittings on them and a transmission system. The area of contact between the soil and the hull of these boats is large, but the unit pressure is slight. The unit can float on the mud surface in operation, and its drive wheel may be adjusted upward or downward to specific depths according to the depth of the field in order that the drive wheel penetrate to a specific depth. When the driving unit is moving forward, it does not break up the hard underwater layer in the fields. Its maximum towing strength is 472 kilograms, 40 percent higher than for hand tillers of the same efficiency. It is capable of plowing 2.5 mu per hour, of rototilling 2 to 3 mu, and leveling 4 to 5 mu. This is twice again the efficiency of hand tillers of the same efficiency, and consumption of petroleum per mu is from 20 to 30 percent less. Fitted with rubber tires, it can be used for short distance hauling.

Currently more than 40 counties and municipalities in Hubei Province are promoting this type mechanized tilling boat, and there are more than 18,000 of them in operation throughout the province.

9432
CSO: 4007

BRIEFS

CRASH REAPING, SOWING--A Hubei Radio commentator's article said that crash reaping and sowing will soon begin in the countryside. It pointed out that from 20 July to 10 August, it is necessary to reap early rice, crash transplant late rice, tend cotton, mid-season rice, autumn dry land crops, autumn oil-bearing crops and diversified economic crops and make overall arrangements. This year, due to climatic reasons, the ripening of early rice in the province was delayed from 5 to 7 days. The recent continuous rain has made it difficult to reap early rice and transplant late rice. Putting various systems of production responsibility on a sound basis is an important guarantee for victoriously launching crash reaping and sowing. The leadership at all levels must be concerned about the masses' daily life. [Wuhan Hubei Provincial Service in Mandarin 1100 GMT 20 Jul 80 HK]

TEST-TUBE CARP--Wuhan, 23 Jul--The first asexually produced golden carp, developed from a single fish somatic (body) cell and cultured in a test tube, has grown to a length of 7 centimeters in 70 days. It was bred by scientists of the Institute of Hydrobiology of the Chinese Academy of Sciences in Wuhan, Hubei Province. The scientists cultured developing blastular cells taken from a golden carp and transplanted the cells from one culture vessel to another 59 times in 385 days. Then using a glass capillary, they transplanted the nucleus of a cultured cell into a golden carp egg with its nucleus removed. The tiny golden carp came into being after several hours. Scientists say that the success points to the possibility of animal somatic cell breeding and cultivating new varieties of fish from somatic cells cultured in a test tube. The golden carp bred by the asexual method is now being raised in a water tank in a laboratory of the Wuhan institute. Scientists say that it is growing normally. [Beijing XINHUA in English 0744 GMT 23 Jul 80 OW]

FARMWORK ASSISTED BY PLA--PLA units stationed in Wuhan have provided active assistance to local reaping and sowing in recent days. A certain antiaircraft gun division of the air force of the Wuhan PLA units issued a circular to its regiments on making good arrangements for combat-readiness training while supporting local farmwork. The division assigned 2,000 commanders and fighters and 15 vehicles to reaping and sowing. PLA unit 87071 stationed at Hongshan sent personnel to help local farms reap early rice on 24 and 25 July when the weather cleared after rain. PLA unit 34531, and the Hongshan District people's armed forces department also sent cadres and fighters to help local farmwork. [Wuhan Hubei Provincial Service in Mandarin 1330 GMT 1 Aug 80 HK]

CSO: 4007

HUNAN

BRIEFS

REAPING, SOWING--A short commentary in Hunan radio revealed that the busy season of crash reaping and sowing is rapidly drawing near. While cultivating seedlings this year, there were low temperatures and rain. As a result, the transplanting of early rice was delayed. However, the weather improved in May. At present, the growth of rice is better than during the corresponding period of last year and the ripening time will not be later than last year. This year, there are more late-maturing crops. Therefore, only by completing the tasks of crash reaping and sowing in time can the seedlings be prevented from overmaturing. It is now necessary to collect more manure for late rice, prepare all kinds of agricultural machines and tools and mobilize all trades and professions to support crash reaping and sowing. [Changsha Hunan Provincial Service in Mandarin 1100 GMT 28 Jun 80 HK]

CHANGDE PREFECTURE FLOODING--The Li River areas in Changde Prefecture are still flooding and the people in these areas are resisting floods. The water level in the river rose rapidly after heavy rain from 24 to 26 June. The water level in most areas is now 1 meter above the danger level, bringing on the second serious flooding of the year. In Li County, 30,000 mu of farmland was flooded. By 29 June, the flood crests in the Li River had begun to subside. Some 1.1 million mu of farmland were flooded. [Changsha Hunan Provincial Service in Mandarin 2315 GMT 29 Jun 80 HK]

CHEMICAL FERTILIZERS--According to statistics released by the Hunan Chemical Industry Bureau on 30 June, in the first half of 1980, the people in Hunan produced 2.52 million tons of chemical fertilizers and fulfilled 61 percent of the year's plans. This was an increase of 38 percent over the corresponding period of 1979, earning 9.8 times the profit earned over the whole of last year. Last winter and spring, the province experienced low temperatures and rain over a prolonged period. As a result, the growth of green manure in the province was not good that year. Since April this year, the daily output of chemical fertilizers throughout the province has increased from 11,000 tons to 13,000 tons. In the first half of this year, the output of urea reached 362,000 tons. This was 3.78 times the urea produced in the corresponding period last year. [Changsha Hunan Provincial Service in Mandarin 2315 GMT 1 Jul 80 HK]

SERIOUS DROUGHT—At present, drought is worsening in Lingling prefecture. This year, the water storage declined by 400 cubic meters over last years and is 50 million cubic meters less than 1978, which experienced serious drought. At present, 21 medium reservoirs and 900 small reservoirs throughout the prefecture are being managed with economic methods. After adopting these methods, 2.2 million mu of late rice in the prefecture have been properly irrigated. [Changsha Hunan Provincial Service in Mandarin 1100 GMT 31 Jul 80 HK]

RAPESEED OIL--By 10 July, 314,000 dan of rapeseed oil had been purchased throughout Hunan, overfulfilling the year's plans for the purchase of rapeseed oil by 21 percent. Last winter and spring, rape in various areas was damaged by serious natural disasters. However, the communes and brigades strengthened field tending, resisted drought to protect the seedlings, prevented insect pests and applied more manure. In April and May, there was an excess of rain. [Changsha Hunan Provincial Service in Mandarin 2315 GMT 21 Jul 80 HK]

FLOODING REPORTED--From 16 to 19 July, torrential rains and storms fell on the western and northern parts of Hunan. As a result, the third flood crest of the year appeared along the Li River areas, flooding some areas along the Li River and west of Dongting Lake. The party organizations at all levels in Changde Prefecture and the armymen and people have once again been urgently mobilized and have plunged into the fight against floods. Some 210,000 laborers were mobilized. By 23 July, the flood waters in Shimen and Li counties had subsided. The cadres and masses are resuming production and conducting crash reaping and sowing. However, in Anxiang and Changde counties and Nan and Yuanjiang counties in Yiyang Prefecture, the water level is still rising. [Changsha Hunan Provincial Service in Mandarin 2315 GMT 24 Jul 80 HK] On 19 July, rainstorms fell in Sangzhi, Dayong and Jishou counties and flooding also occurred. A total of 38,000 mu of rice field and 52,000 mu of dry land crops were affected. Some 205 houses collapsed, killing two persons. A number of water conservancy facilities and property were damaged. [Changsha Hunan Provincial Service in Mandarin 2315 GMT 24 Jul 80 HK]

CSO: 4007

JIANGSU

BRIEFS

LEANER HOGS--To satisfy the wishes of the masses to have more lean pork to eat, the Jiangsu Provincial Foodstuff Company and the Jiangsu Provincial Shazhou County Foodstuff Company's hog farm cooperated and raised a new hog variety that produces a high percentage of lean meat. At present, it is being vigorously popularized. This new hog variety, bred from the Dulouk-type lean meat hog as the sire and the superior local variety of Erhualian hog of Jiangsu Province, is named the duer [2629 0059] hybrid hog. After weaning, the hog is raised for 158 days, during which time the average weight of each hog increases one jin a day. With the same feed and under the same management conditions, the slaughter rate is 2 percent higher than that of the suer hybrid hog, bred from the Russian big white hog as the sire and the erhualian hog as the sow, or of the yueer hybrid hog, bred from the Yorkshire hog as the sire and the erhualian hog as the sow, and 3 percent higher than that of the pure erhualian variety. Also, the proportion of lean meat constitutes 51.24 percent of the body, higher than that of the "suer" hog by 8.7 percent, the "yueer" hog by 7.6 percent, and the erhualian hog by 16 percent, and also the Yorkshire hog variety by 6 percent. On the average, each duer hybrid hog produces 8 jin more lean meat than the suer, yueer, or pure Yorkshire hog varieties, and 20 jin more than the erhualian hog. In addition, the duer hybrid hog consumes less feed per increase of one jin of live weight than do the others. [Text] [Beijing GUANGMING RIBAO in Chinese 21 Apr 80 p 2] 9269

CSO: 4007

BRIEFS

AGRICULTURAL BANKING--The agricultural banks in Jiangxi have actively supported the peasants to do a good job of domestic sideline production and commodities production. In the first half of this year, the credit cooperatives throughout the province provided 9.07 million yuan in loans with 44 percent for developing domestic sideline production of the commune members and building residential houses. This spring, the provincial agricultural bank expanded the limits of loans to individual commune members. In addition to developing sideline production, the commune members can also obtain loans from the local credit cooperatives when they have difficulties in their daily lives. [Nanchang Jiangxi Provincial Service in Mandarin 1100 GMT 30 Jul 80 HK]

CSO: 4007

BRIEFS

SANITATION INSPECTION GROUP--Having been approved by the Jilin Provincial People's Government, the Jilin Provincial Foodstuff Sanitation Inspection Group has been formed. It will begin inspection in various localities throughout the province on 11 July. The inspection group is headed by Liu Yunzhao, deputy governor of Jilin Province, and includes municipal mayors, autonomous prefectural heads in charge of sanitation work and responsible persons from provincial departments appointed as deputy leaders. The group will inspect the sanitary condition of food processing, nonstaple food and village fairs in nine municipalities and several counties in the province. [Changchun Jilin Provincial Service in Mandarin 1100 GMT 10 Jul 80 SK]

JAPANESE ECOLOGY EXPERT--At the invitation of Jilin Normal College, a Japanese expert in pastoral ecology arrived in Changchun 15 July. He is to give lectures during summer vacation and visit the Changling County Stud Farm in Jilin Province and the Xilin Gol League Breeding Stock Farm in Nei Menggol region. [SK180200 Changchun Jilin Provincial Service in Mandarin 2200 GMT 15 Jul 80 SK]

RURAL PURCHASING POWER--With the development of the rural economy and a rise in rural living standards, the purchasing power of rural areas in Liaoning Province increased by about 15 percent during the first half of 1980 over the corresponding 1979 period. Per capita purchasing power in rural areas was 105 yuan, an increase of 13 yuan over the corresponding 1979 period. Despite the increase in purchasing power, the savings of rural commune members increased 69 percent over the corresponding 1979 period. [Changchun Jilin Provincial Service in Mandarin 1100 GMT 29 Jul 80 SK]

CSO: 4007

BRIEFS

REPORT ON SILKWORMS--Liaoning Province has reaped 60,000 dan of silkworms this year despite unfavorable weather during the spring. [SK020302 Shenyang Liaoning Provincial Service in Mandarin 1100 GMT 29 Jul 80 SK]

PORK PRICE--In order to solve the surplus of hogs and protect peasants' interest in raising hogs, the Liaoning Provincial People's Government recently issued a circular deciding to lower again the selling price of pork on a temporary basis, beginning 1 August to the end of the month. [SK020302 Shenyang Liaoning Provincial Service in Mandarin 1100 GMT 31 Jul 80 SK]

MARKETABLE GRAIN BASES--The state council recently decided to build marketable grain bases in northeast China. Changtu, Kaiyuan, Tieling, Faku and 13 other counties in Liaoning Province are included. The rural population in these 17 counties accounts for 35 percent of the province's population and the cultivated area in the 17 counties accounts for 36 percent of the areas under cultivation in the province. Their output of grain and soybeans in 1979 accounted for 49 percent of the province's total output. LIAONING RIBAO carried a commentator's article, stressing the necessity of developing agricultural mechanization while building a marketable grain base. [Shenyang Liaoning Provincial Service in Mandarin 2200 GMT 27 Jul 80 SK]

HEAVY RAINFALL--Rain fell throughout Liaoning Province from 24 July to 26 July. Rainfall was heavy in Dandong, Luda, Fushun municipalities and Tieling Prefecture. Meanwhile, the water levels of various rivers increased. The province has entered the flood season. Therefore, all localities are working to strengthen flood prevention. [Shenyang Liaoning Provincial Service in Mandarin 2200 GMT 26 Jul 80 SK]

AGRICULTURAL MACHINERY ENTERPRISES--Agricultural machinery enterprises in Liaoning Province scored achievements in popularizing measures on energy economizing. According to statistics, 40 key agricultural machinery enterprises saved 1,730 tons of oil, 3 million kwh of electricity and 4,500 tons of coal in the first 6 months of 1980. [Shenyang Liaoning Provincial Service in Mandarin 1100 GMT 27 Jul 80 SK]

CSO: 4007

FORUM HELD ON PRODUCTION IN MOUNTAINOUS AREAS

Encouragement, Development Stressed

SK110228 Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 9 Jul 80

[Excerpts] According to our sources, Nei Monggol autonomous region recently held a forum on production development in the mountainous and old revolutionary base areas [Shan Lao Qu] across the region. In emphasizing issues such as how to change the backward outlook in these areas as soon as possible, the forum pointed out: At present, efforts should be made to bring into play the enthusiasm of the people of various nationalities mainly by implementing the party's policies. It is necessary to further emancipate minds, relax the restrictions of economic policies on the people to match the actual situation in these areas and greatly lighten the people's burden.

The forum brought forward the following six points for developing the economy in these mountainous and old revolutionary base areas:

1. Remove all restrictions on the number of privately owned animals in these areas.

2. Actively encourage and support commune members in carrying out afforestation work.

3. Communes and brigades, where conditions permit, may allow their members to have a certain amount of sandy, mountainous and waste land to plant trees and forage crops. All incomes gained from these should belong to the commune members themselves and the ownership by the commune members of these lands should be ensured for a long time.

4. Encourage commune members to enclose pastures in pastoral areas and allow them to plant trees and grass as well as to plant vegetable and millet crops proportionally and to set up hay cutting workshops. It is also necessary to help them strengthen their capacity to combat natural adversities and improve their daily life.

5. Properly revise the minimum level of agricultural and livestock tax production teams pay to the state, and exempt production teams which have excessively poor harvest from handing over grain and livestock to the state for several years.

9. Commune members have the right to freely handle the by-products produced of their sideline agricultural and livestock production. These by-products may be sold to the state and may be sold by negotiating prices at agricultural trade markets. All retailers and peddlers of by-product commodities are allowed to carry on their sales from house to house.

Vice Chairman Addresses Forum

SK100111 Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 9 Jul 80

[Text] According to our reporter (Li Wenyan) and Nei Monggol RIBAO's reporter (Tong Meng), Shi Guanghua, vice chairman of the Autonomous Regional People's Government, addressed the forum held on 7 July on production and construction in the mountainous and old revolutionary base areas [Shan Lao Qu] of the autonomous region. He pointed out that the principle for building up these areas should be based mainl on grasping the production bases of forestry, forage cultivation and animal husbandry, using methods suitable to the conditions of each area and fully developing each area's strong points. Efforts should be made to engage in agricultural production, animal husbandry, forestry or production of oleaginous crops, so long as they are suitable to local conditions, in order to develop a diversified economy, ensure efficient development and do the utmost to help the people in backward areas become better off as soon as possible.

He stated: The key to this principle lies in taking measures suitable to the conditions of the areas. This means that specific areas should develop the production of what is suitable to the local conditions. Only by following this principle can we keep our work in harmony with both the laws of nature and laws of economics and abolish one-sided practices and avoid acting in terms of absolutes.

The comrade also stated: The principle itself is not absolute. According to their practical conditions, various localities still have room to change and improve on this principle.

CSO: 4007

NEI MONGGOL

MEASURES PLANNED TO IMPROVE LIVESTOCK BREEDING

OW300915 Beijing XINHUA Domestic Service in Chinese 0750 GMT 29 Jul 80

[Text] Hohhot, 29 Jul--The Nei Monggol autonomous regional people's government recently published a plan for improving domestic animal breeding in the region. Pointing out the orientation of improvement according to different zones, the plan was mapped out for further utilizing the natural superiority of different types of grasslands in various localities in order to steadily develop animal husbandry qualitatively and quantitatively.

The Nei Monggol Autonomous Region is one of China's important pastoral bases. To upgrade animal raising, the autonomous regional people's government summed up experience in improving domestic animal breeding over the past 30 years and analyzed the natural conditions in the region's various localities for developing animal husbandry undertakings. The regional plan was formulated on the basis of this analysis and in accordance with the requirements of these undertakings set forth by the state.

According to the plan, the Caodian Prairie and the typical grassland tracts in eastern Nei Monggol where conditions are fairly good should be utilized for the primary purpose of raising dairy-meat cattle of fine stock, fine-wool sheep and other cattle and sheep of locally improved stock. The desolate and semidesolate prairies in the central parts of the region where conditions are fair will be used for the main purpose of raising medium-wool and fine-wool sheep. Dairy cattle should be raised on the outskirts of cities and towns and meat cattle in the agricultural, semiagricultural and semipastoral zones. The wastelands and Gobi Desert areas in the western parts of the region where conditions are poor will be used for raising mainly camels, San Bei sheep [san bei yang 0005 0554 5017] and goats.

To insure implementation of the plan, the animal husbandry departments of the region have set forth the following four measures in light of the actual conditions of livestock raising:

--The distribution of stud livestock of fine quality in various localities will be gradually arranged in accordance with the above-mentioned plan for the region;

--Stud livestock that does not meet the requirements set forth in the regional plan should be transferred so that animal husbandry in various localities will surely develop in a way that would best suit the natural conditions of the localities;

--Different animals should be separated from each other and raised separately in different herds;

--Building of grassland tracts and stables should be carried out while efforts are being made to improve the quality of domestic animals.

CSO: 4007

NEI MONGGOL

BRIEFS

LIVESTOCK BREEDING--The rural areas of Nei Monggol's Ulangab League have successfully brought up 4.2 million young animals since early this year. Over the past 2 years, effective measures have been adopted to make full use of the favorable conditions of Ilangab League's rural areas to breed livestock. In Qingshuihe County, some 60,000 mu of fine-grade fodder grass were planted. Since 1980, most production brigades in Ulangab's rural areas have established the system of fixed responsibility in production to promote livestock breeding. According to statistics, the number of privately raised livestock shows a net increase of 600,000 head over 1976. [Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 23 Jul 80 OW]

ANIMAL HUSBANDRY--Sixteen communes in Guyang County of Nei Monggol report goods results in livestock breeding. The number of livestock have reached 484,000 head, an increase of 42,500 head over 1979. Over the past few years, the party committee of Guyang County has helped 3 communes and some 200 production teams to readjust their production plans, giving priority to livestock breeding. The number of animals of fine breeds and improved breeds increased by 6,600 and 42,000 head respectively as compared with 1979. The county had purchased 979,000 jin of wool and fats by late June. [Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 23 Jul 80 OW]

BEEF BASES--The 32 beef bases built in the 32 banners and counties of Ju Ud, Hulun Buir, Jirem and Xilin Gol Leagues 2 years ago now have 2.5 million head of cattle, 70 percent of the cattle in the region. In the past 2 years, these bases have handed over to the state nearly 300,000 head of farm and beef cattle and 80,000 tons of milk. They also exported beef and cattle equivalent to 50,000 head. [Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 30 Jul 80 OW]

CSO 4007

QINGHAI

BRIEFS

LIVESTOCK BREEDING--Commune members of Qinghai's Huangzhong County have by now raised some 240,000 head of livestock by themselves. The county has also encouraged the commune masses to raise more milk cows and goats. Some 70,000 yuan in investment has been appropriated to help poor production teams breed milk goats. Since early this year, the county has sold some 700 head of livestock to other localities. [Xining Qinghai Provincial Service in Mandarin 1100 GMT 23 Jul 80 OW]

CSO: 4007

SHANDONG

BRIEFS

RESEARCH ON SOYBEAN PESTS--Since its establishment in 1973, the Soybean Insect Pests Cooperative-Research Team of Huimin Prefecture, Shandong Province, has attained important achievements on three topics of studies, namely: "Study on Black Soybean-Stem Miners in Shandong," "Study on Soybean Pod Borers in Northern Shandong," and "The Pattern of Distribution of Black Soybean-Stem Borers and Its Application in Practice." In recent years, the results of these studies were applied to the control of these two types of insects on more than 400,000 mu of soybean fields annually in the team's district, possibly reducing soybean loss by more than 8 million jin. The stem miner is a major soybean pest in the Huanghe and Huaihe basins and in areas south of the Changjiang River. [Summary] [Jinan DAZHONG RIBAO in Chinese 14 Jul 80 p 1]

SOYBEAN PESTS CONTROL METHODS--The methods discovered by the Soybean Insect Pests Cooperative-Research Team of Huimin Prefecture, Shandong Province, for controlling black soybean-stem miners have been applied to more than 200,000 mu of soybean fields in Huimin Prefecture. Over 120 units in 13 provinces and municipalities in China have exchanged technical information with the team in recent years. The U.S. Soybean Insect Pests Research Information Center and the Entomology Team of the Natural Resources Investigation Institute of Illinois wrote to this Chinese team for information on four occasions. [Summary] [Jinan DAZHONG RIBAO in Chinese 15 Jul 80 p 3]

RAINFALL EASES DROUGHT--Between the afternoon of 24 July and the morning of 25 July, Shandong Province had heavy rainfall over the vast majority of Huimin and Changwei prefectures, the northeast areas of Dezhou and Taian prefectures, the northern area of Linyi Prefecture, a number of counties in Yantai Prefecture and in Ziboi and Qingdao municipalities. The amount of precipitation ranged from 25 to 95 mm and has greatly eased the summer drought. [Jinan Shandong Provincial Service in Mandarin 2300 GMT 25 Jul 80 SK]

WHEAT HARVEST--Jinan, 22 Jul--Pingdu County in Shandong gathered in a rich wheat harvest this year from 1.15 million mu. The total yield increased 10 percent compared with 1979, a record year. As of 15 July, the commune members had already delivered more than 100 million jin of wheat to state warehouses. [Beijing XINHUA Domestic Service in Chinese 0807 GMT 22 Jul 80 OW]

AQUATIC PRODUCTS--Yantai Prefecture of Shandong Province turned out a total of more than 105,000 dun of aquatic products in the first half of 1980. This is about one tenth of the total national output for the same period, and the total output value reaches more than 49 million yuan. [Beijing Domestic Service in Mandarin 0400 GMT 26 Jul 80 OW]

CSO: 4007

SHANGHAI

NEW AGRICULTURAL TECHNIQUES DEVELOPED, POPULARIZED

Beijing GUANGMING RIBAO in Chinese 28 Apr 80 p 2

[Article by Sun Hongxiang [1327 3163 4382]: "The Shanghai Suburban Agricultural Science Network Has Done Five Good Deeds"]

[Text] In recent years, the fourth-level agricultural science network in the Shanghai suburbs has done five good deeds in its efforts to popularize new agricultural techniques:

1. They explored experiences in raising unit production over a large area by carrying out scientific experimentation on a wide scale using the method of combining experimentation, demonstration, and popularization. The Shanghai County Agricultural Science Institute test-planted "Jain yu No 1" wheat on 1.75 mu of land. Per mu yield reached 978.7 jin. The Tongxin No 1 team of the Changxing Commune of Baoshan County test-planted 4 mu of foodgrains. The average yield in ordinary years surpassed 3,000 jin per mu. These have provided a scientific basis for elevating unit production over a large area.

2. Superior varieties were selectively bred, and the major varieties were restored and purified. According to statistics, agricultural science organizations at all levels and superior seed farms throughout the suburban area cooperated closely last year and cultivated 2.53 million jin of the original varieties of triple wheat, 3 million jin of original varieties of early rice, and 7.3 million jin of original varieties of late season rice. These have created advantageous conditions for achieving bumper harvests in this year's foodgrain production.

3. Effective new techniques have been actively popularized. The techniques of transplanting cotton after wheat, cultivating seedlings of early rice in greenhouses without soil, utilization of heterosis of vegetables, cultivation of vegetables in a factory environment, cultivation of seedlings of rape in two stages, reducing irrigation of seedlings to increase resistance without soil, "pulling away strips to preserve the seedlings," and deep application of ball-shaped carbon-ammonia fertilizer were all popularized and increased production yields. The new method of preventing cotton aphids, in

combination with the rational use of farm chemicals, reference to weather factors, and development of natural enemies, evolved jointly through research by the Biology department of Fudan University and the plantlife preservation station of the Shanghai City Agricultural Bureau, was popularized in the Shanghai suburbs. In 3 years, over 1.3 million yuan were saved in expenses for farm chemicals.

4. Efforts were made to frequently survey, study, and analyze the conditions of the seedlings, diseases, and insects as well as meteorological conditions, to grasp production activities, to provide agricultural information for agricultural departments at each level, to develop technical measures, and to serve as good advisors for production. Last year, each production team of the Zhangyan Commune in Jingshan County carried out measures to prevent diseases and insect pests in a timely and correct manner, using forecasts of disease and insect pests provided by the agricultural science station of the commune. The cost of farm chemicals for the entire commune for summer ripening and early rice was lower than that for the year before last by about 90,000 yuan.

5. Scientific knowledge was popularized and technical training was intensified. Last year, 56 training classes in various agricultural technologies were held throughout the suburban area. There were over 33,300 participants.

9296
CSO: 4007

HOW JINSHAN COUNTY IS BECOMING RICH

Shanghai JIEFANG RIBAO in Chinese 22 May 80 p 1

[Article by correspondent Zhang Zhiyuan [1728 1807 6678]: "Poor Jinshan Walks The Road of Riches Through Overall Development of Agriculture, Sideline Occupations, and Industry"]

[Text] Jinshan County in the distant suburbs of this city has sent joyous news: a "purely agricultural county" that formerly engaged only in grain production has now begun to walk the path of rural village industrialization. In the course of the 3 years following the smashing of the "gang of four," Jinshan County has actively changed the internal composition of its agriculture, even while doing a good job of agricultural and sideline industry production, to broaden its avenues of production. Throughout the province, commune- and brigade-operated small industrial plants have burst forth like bamboo shoots following a spring rain. Average profits from commune and brigade industry have increased during the past 3 years by 3.6 times the average figure for the past 10 years. As a result of the overall development of agriculture, sideline occupations, and industry, the standard of living of the masses has risen very rapidly. In the course of the past 2 years alone, average per capita disbursements to commune members throughout the county have increased by 112 yuan. The peasant masses say happily: "Neither gold bars nor silver bars are as good as the '16 Articles'." That Jinshan is able to walk the road to riches results entirely from the determination to rely on good policies of the Party Central Committee and to rely on the implementation throughout the county of the eight-character policy of "readjustment, restructuring, consolidation, and improvement."

Jinshan County is a major grain-producing area of the Shanghai suburbs which annually provides the state one-third of all the commodity grain provided by the 10 counties of the suburbs. It is known as the "little granary" of this city. But as a result of the long-term disturbances caused by the ultraleftist line of the "gang of four," Jinshan County was impelled into the production of grain alone, with the development of its commune and brigade industry being subjected to all sorts of restrictions, so that it became a "purely agricultural county" with an extremely fragile commune and brigade industrial base.

After studying the two Central Committee documents on agriculture and the eight-character policy of "readjustment, restructuring, consolidation, and improvement," the CCP Committee of Jinshan County diligently analyzed the crux of the problem of Jinshan County's slow development of production and why the rural villages were not becoming rich quickly. The reason was, first of all, that the area for the three-crop system in Jinshan County was becoming increasingly saturated, with the potential of the soil becoming smaller and smaller. In such circumstances, sole reliance on much arduous toil with "three rakes and six hoes" could no longer bring about large-scale increases in per unit yields to increase income. There would have to be an extremely great increase in the amount of scientific farming and mechanization. Secondly, a rapid increase was taking place in the labor force of rural villages. Within only 3 years, the labor force had increased by 30,000 throughout the county. To escape from the dead end of a single product economy and to break the production dilemma, it was necessary to resolve two prerequisites: one was the arming of agriculture so that money for scientific farming and mechanization could come in and so that excess labor would have an outlet. In a word, it was necessary to vigorously develop commune and brigade industry and resolutely take the path of rural village industrialization.

The Jinshan County CCP Committee adopted the three measures of mental arousal, organizational implementation, and institution of economic policies to make an overall readjustment of the relationship between agricultural production and commune and brigade industrial production, and the relationship between long-term and short-term production within commune and brigade industries. In order to develop commune and brigade industry rapidly, not only did the County CCP Committee secretary personally take part, but he also appointed a deputy secretary and a vice chairman of the County Revolutionary Committee to be separately in charge. The county also specially established a commune and brigade industrial bureau, and each individual commune has special supervisory personnel with the secretary of the CCP Committee also taking part personally. Each time the county holds a production conference, the County CCP Committee leadership always places commune and brigade industry in a place of equal importance with agricultural production, giving attention alike to agriculture, sideline occupations, and industry. After a year of major readjustments, a new situation has appeared. Throughout the province a total of 78 commune and brigade industrial plants have been either newly constructed or enlarged, and nearly 10,000 laborers in excess of agricultural needs have been provided for. Last year more than half of the commune-operated industries showed profits of more than 10,000 yuan, and throughout the province more than 220 production brigades operated small industrial plants. As a result of the county's implementation of a series of economic policies such as "commune ownership of what the commune operates and brigade ownership of what the brigade operates," as well as "deduction of a percentage of disbursements," the enthusiasm of the mass of commune members has gone higher and higher; the road of production by commune and brigade industrial plants has become wider and wider; and the quality of output has steadily improved. Given the vigorous support of the Municipal Textile Bureau, the Foreign Trade Bureau, and the main petrochemical plant, 29 different items in 10 different categories were produced by Jinshan County's commune and brigade light textile and handicraft industries alone. Of these, quite a few products found distant markets in more than 10 countries and regions.

Jinshan County's experiences during the past 3 years in developing commune and brigade industry demonstrates that agricultural production and commune and brigade industry are mutually reinforcing, and that the kind of thinking which holds that the development of industry must weaken agriculture is completely without foundation. During the 3 years, Jinshan County has used profits from commune and brigade industries to arm agricultural sideline industries for the benefit of agriculture, sideline occupations, and industry alike in the promotion of overall development. During the past 3 years, Jinshan County's agricultural sideline occupations have continued to burgeon. This county has increased its proportion of the total amount of commodity grain provided the state by the whole suburban area. In 1979, Jinshan County's per unit yields of grain surpassed the highest levels in history; per unit yields of cotton were highest in the municipality; and more than 960,000 hogs were raised for slaughter, or 1.8 head per mu of fields. An average 244 jin of hogs per capita were marketed to make Jinshan County an advanced unit in hog production nationwide.

9432
CSO: 4007

BRIEFS

SHANGHAI NONSTAPLE FOOD BASE--As part of a program of having suburban production serve the needs of the city, an enclosure dike was built for the Haibin nonstaple food base in Nanhui County last April. Put into production last May, in the short space of only 8 months it provided the people of the city with 250,000 jin of fresh fish, 110,000 jir of fresh eggs, and 130,000 jin of poultry. It also yielded fresh mushrooms, tremella, and rabbits, the tidelands providing benefits the same year they were enclosed. Between January and April of this year, the total output value of agriculture, sideline occupations, and industry exceeded 1 million yuan. A year ago, this area was a thicket of rushes and reeds. A tideland area of 7,000 mu, it had no roads or lights. Early last April, 100,000 civilian laborers were organized from throughout the county, and after 2 weeks of hard work they had built a broad sea dike 10 kilometers long to enclose more than 5,000 mu of fish ponds and 350 mu of choice pools for raising fish. Basic-level CCP committees repeatedly propagandized the workers on the political and economic significance of having suburban production serve the cities, proposed various measures for overcoming difficulties, and hastened the speed of development of nonstaple food production under conditions of a shortage of manpower, the press of time, and a lack of funds. They strived first of all to achieve development of whatever is lacking in the market. Last year, in the first year of production, they thought of ways to take advantage of the slack season in chickens, ducks, and geese, and before any such nonstaple foods had reached the market they sent a steady flow to market of the first batch of more than 8,000 early spring ducks and geese. Though they were unable to take advantage of the season for raising fresh water fish, because the fish ponds had not been completed, they subsequently strengthened measures for management of fish raising and were able to supply fish for the spring season. [Text] [Shanghai JIEFANG RIBAO in Chinese 21 May 80 p 1] 9432

CSO: 4007

'SICHUAN RIBAO' ON REDUCING AGRICULTURAL PRODUCTION COSTS

HK030648 Chengdu Sichuan Provincial Service in Mandarin 2300 GMT 1 Aug 80

[Report on 2 Aug SICHUAN RIBAO article by commentator: "Seek Effective Economic Results and Reduce Agricultural Production Costs"]

[Text] The failure to seek effective economic results and the practice of spending too much on production costs in the basic accounting units of the rural people's communes has become an outstanding problem in rural management. The time has come when we absolutely must solve this problem.

The article says: Due to the fact that the principle of running the communes with diligence and thrift is not implemented effectively, some places pay no attention to economic results, while their managment work is poor, with the result that the increase in their production costs greatly exceeds the increase in their agricultural income. In this way their income fails to increase, or even declines, when they increase production. Unless this problem is solved as rapidly as possible, it is bound to harm the peasants' enthusiasm for production and affect the all-round development of agriculture.

The article says: To reduce agricultural production costs, it is necessary to continue to eliminate the pernicious influence of Lin Biao and the gang of four and criticize the fallacy of only bothering about politics without bothering about economics. It is necessary to fully understand the great importance of instituting economic accounting, making economic analysis, seeking economic results and reducing agricultural production costs. We must grasp increasing production on the one hand and practicing economy on the other, and insure that the agricultural investment and material are used in the most rational way. We should also seek to achieve the best possible economic results from the least possible investment. In the course of carrying out the responsibility system of linking remuneration to output, it is necessary to actively set norms for production costs. At the same time, we must continue to cut down on nonproductive expenditure and be vigilant against the practice of arbitrarily increasing the economic burden of the production teams.

The article says: Putting into effect the system of taking full responsibility for one's own investment is an effective measure for saving expenditure and reducing agricultural production costs. It is also a component of the responsibility system of linking remuneration to output. Apart from looking after their output, the production teams should also take full responsibility for their own investment. It is necessary to closely link increasing production and practicing economy with the vital interests of the peasants. This is beneficial for running the production teams with diligence and thrift, saving expenditures, reducing production costs and increasing income.

The article says in conclusion: The key to reducing agricultural production costs lies in strengthening leadership over production team management, especially financial management. The leaders at all levels must enhance their understanding and awareness, attach importance to this work, strengthen specific leadership, and actively help the communes and brigades to set up financial management systems and put them on a sound basis and strengthen financial management. They should ceaselessly achieve new success in reducing agricultural production costs.

CSO: 4007

JOINT LIVESTOCK-INDUSTRIAL-COMMERCIAL COMPLEX DEVELOPS

Beijing RENMIN RIBAO in Chinese 24 May 80 p 1

[Article: "Great Development in Integrated Livestock, Industrial, and Commercial Enterprise in Zoige County"]

[Text] SICHUAN RIBAO reported on 10 May that the Zoige County livestock, industrial, and commercial complex has built onto last year's accomplishments by continuing this year to support the principle of mutual economic benefits and further expand the scope of coordination by adopting various unified methods. Currently there are 7 state-owned livestock farms, 10 commune-operated businesses, 79 production brigades, and 2 county-owned businesses that are economically integrated as a complex, and they have invested 6.16 million yuan in the complex to promote its development.

Since June of last year, the Zoige County livestock, industrial, and commercial complex has placed emphasis on livestock production and on exceeding the state plan in processing of commodities and in sales work, in order to make the most of their own capabilities. Within the short space of a half year, the complex has exceeded plan in the processing of commodities and has earned 1.05 million yuan in sales, making a profit in its initial year. Because the complex has given intense attention to the rational distribution of profits and has given material benefits to the livestock farms and affiliated communes and brigades that are part of the complex, it has earned the confidence of the masses of all races throughout the county.

Early this year, the Zoige County livestock, industrial, and commercial complex started with a summarization of last year's experiences and continued to maintain the principle of mutual economic advantage, adopting numerous unified methods to expand the scope of coordination: (1) pooling resources for investment in shares to operate businesses, with sharing of bonuses on the basis of net profits; (2) integration on the basis of specialized production; (3) ploughing back profits from business enterprises, forestry, and industrial integration; (4) joint planting of rape by businesses enterprises and livestock farms in cooperation with communes with a division of product; (5) a combination of business enterprises, communes, brigades and the complex giving economic and technical support to the development of production by communes and brigades. Once the communes and brigades completed state-planned production, excess products were turned over to the complex for processing and sale, with a division of profits being made. As a result of the aforementioned five kinds of integration, with their extremely heavy emphasis on rational distribution of economic benefits and strenuous efforts to make a greater distribution of greater benefits to the units integrated into the complex, the initiative of every livestock farm, commune, and brigade allied economically with the complex was stimulated. This year, 89 communes and brigades have joined the complex, and 97 units have made investments in the complex. Two farms and communes have signed contracts with the complex to grow rape. Statistics show that throughout the county, 100 percent of the state-owned livestock farms, 63 percent of the commune-operated business enterprises, and 92 percent of the production brigades are currently affiliated with the complex. The complex has already set up a motor vehicle transportation company, an agricultural reclamation company, a livestock products trading company, a forage grass seed company, and a livestock industry machinery main station.

The Zoige County livestock, industrial, and commercial complex is currently bending every effort to support the building of grasslands for the various livestock farms, communes, and brigades, to prevent and control cattle diseases, and to improve the herds.

9611
CSO: 4007

BRIEFS

MEAT PRODUCTION INCREASED--The total amount of pork, beef and mutton produced in Sichuan in 1979 was 30 percent greater than in 1978. For 1979, the per capita meat consumption was 31 jin, and the output value of the livestock industry made up about 20 percent of the total agricultural output value. [Summary] [Chengdu SICHUAN RIBAO in Chinese 16 May 80 p 2]

SPRING TEA OUTPUT--As of 10 May, the output of spring tea in Yibin Prefecture of Sichuan registered a 22.13 percent increase over the same period of last year. Higher grades and better prices brought the tea growers an additional income of about 40 yuan per dan this year as compared with the prices of previous years. [Summary] ,Chengdu SICHUAN RIBAO in Chinese 22 May 80 p 1]

MORE FERTILIZERS AVAILABLE--As of the end of April, the amount of solid nitrogenous fertilizer and phosphorus fertilizer purchased by the provincial government for distribution to rural areas in Sichuan this year was considerably larger than that of the same period last year. Nearly 2 million tons of these and other chemical fertilizers were already shipped to communes and commune members and this amount was 14 percent greater than that of last year. [Summary] [Chengdu SICHUAN RIBAO in Chinese 23 May 80 p 1]

EFFORTS TO INCREASE FISH OUTPUT--The Sichuan Aquatic Products Society held its first annual meeting between 24 and 28 April. The conferees made a proposal on how to accelerate the development of Sichuan's fishery industry and decided to form a Fishery Economic Research Group to launch research on fishery economics. In 1979, only 54 percent of the province's water surface suited for fish raising was actually used for this purpose, and the average fish yield from ponds and reservoirs was only 36 jin and 8 liang for each mu of water surface. As a result, the per capita consumption of fish in Sichuan was less than 1 jin. The conferees agreed that better technology and policy are needed to improve this very low fish yield. [Summary] [Chengdu SICHUAN RIBAO in Chinese 11 May 80 p 2]

FISH RAISING IN RESERVOIRS--Sichuan Province has more than 11,000 reservoirs of all sizes with a total of 1.4 million mu of water surface suited for raising fish. Of this water surface, only 60 percent is used for fish raising, and the output of fish is very low compared with those of some other provinces. The potential of producing more fish in reservoirs in Sichuan is, therefore, very great. [Summary] [Chengdu SICHUAN RIBAO in Chinese 11 May 80 p 2]

RAISING FISH IN PADDY FIELDS--Many people engaged in aquatic production have proposed that fish be raised in irrigated paddy fields. Sichuan Province has many paddy fields suited for raising a wide variety of carps. Experiments by many communes showed that irrigated rice fields with fish raised in them yielded 10-40 percent more rice than those without fish. It required only 1-2 yuan to plant fish fry in 1 mu of paddy field, and after several tens of days, each mu could yield ten to several tens, or even up to 100 jin of fish with a cash value of several to several tens of yuan. [Summary] [Chengdu SICHUAN RIBAO in Chinese 12 May 80 p 2]

FISH FRY FOR PADDY FIELDS--To solve the contradiction between application of farm chemicals and raising fish in paddy fields in Sichuan, Neijiang County has come up with a solution by raising large fish fry to be planted in irrigated paddy fields after the harmful effect of farm chemicals applied to the fields has passed. This county has trained 850 technicians to raise large fish fry in 2600 mu of fish fry farms in preparation for raising fish in 200,000 mu of paddy fields this year. [Summary] [Chengdu SICHUAN RIBAO in Chinese 5 May 80 p 2]

SIDELINE PRODUCTION ENCOURAGED--Since 1978 Qionglai County, Sichuan Province, has taken various measures to increase the commune members' income. The per-capita private plot has been increased, and the commune members are encouraged to raise animals on their own. This year hogs raised by commune members have reached 400,000 head, cattle 1,300 head, sheep and goats 35,000 head, poultry 1 million head and rabbits 100,000 head. Many commune members are engaged in sericulture and beekeeping as household sideline production projects. Commune members are also encouraged to develop such sideline production as basket weaving and woodenware making. Now there are some 20,000 people engaged in such handicraft production, and they can earn some 2 million yuan annually. These measures have enabled the commune members to earn more income in addition to that from collective distribution. By the end of June this year, the commune members' savings deposits in the bank totaled more than 500,000 yuan. [Beijing XINHUA Domestic Service in Chinese 0240 GMT 27 Jul 80 OW]

CSO: 4007

BRIEFS

MECHANIZED RICE TRANSPLANTING--The 21st day of this month marks "grain full" in the lunar calendar, and on this day in the more than 30,000 mu of ricefields in Hangu District, the clearing of the fields preparatory to transplanting rice has been completed and more than 500 mu of rice seedlings have already been planted. In order to grow more rice, with the fall crop supplementing the summer crop, the Hangu District CCP Committee and government have put to use last year's experiences, in which the expansion of mechanized transplanting of rice seedlings by 14 production teams increased production by 10 to 20 percent over manual transplanting. This year the number of transplanting machines has been increased to 146, from last year's 108, and the area slated for machine transplanting has been increased from 36 percent to more than 60 percent. In order to complete this year's machine transplanting plans while maintaining quality and quantity, more than 200 people have been trained as rice transplanter operators. On the day of "grain full," the Hangu District CCP Committee and government convened on-site machine transplanting meetings for 57 brigades of the Yingcheng commune, the Xinjian agricultural team, and the Yingcheng agricultural team to spread experiences in machine transplanting throughout the district. At the same time, they organized an inspection of the chemical weeding of seedling fields at the Luhou brigade of the Datian commune. [Text] [Tianjin TIANJIN RIBAO in Chinese 23 May 80 p 1] 9432

CSO: 4007

XINJIANG

BRIEFS

MORE BEEF, DAIRY CATTLE--Preparations are under way in Xinjiang to breed more and better beef and dairy cattle. This is due to a decreased demand for draft cattle and an increased demand for beef and milk--the result of more mechanized farming and higher living standards. According to investigation by departments concerned, the improved breeds of cattle can produce nearly twice as much of meat and 2-3 times as much of milk as the original local cattle. In 1978 and 1979, trial shipments of improved cattle to Hong Kong were well received by the local people because of its high quality and low prices. [Summary] [Beijing RENMIN RIBAO in Chinese 4 Jun 80 p 1]

MEAT CONSUMPTION--Per capita consumption of meat, poultry and eggs in Xinjiang increased 62.6 percent in the first half of 1980. [Urumqi Xinjiang Regional Service in Mandarin 1620 GMT 26 Jul 80 OW]

WATER CONSERVANCY MEETING--Recently the Xinjiang Regional Water Conservancy Bureau held a meeting to discuss the work of water conservancy in pastoral areas. Measures to build water conservancy projects were studied. Also discussed was the training of technicians in this field of work, particularly the training of minority technicians. [Urumqi Xinjiang Regional Service in Mandarin 1300 GMT 29 Jul 80 OW]

INDUSTRIAL CROPS--Urumchi, 26 Jul--The Xinjiang Uygur Autonomous Region, which produces over 90 percent of China's long-staple cotton, sowed 176,000 hectares of cotton this year, 9.5 percent more than last year. This is one of the measures taken by the multinational region to expand production of industrial crops. In addition to long-stable cotton, the region is also famous for its Hami melon, Turpan grapes and sugar beets. A great variety of oil-bearing crops, including rapeseed, linseed, sunflowers, sesame, peanuts, soya beans, walnuts and almonds, are also grown. This year, the oil-bearing crop area was increased by 30,000 hectares and vineyards, orchards and melon fields were all expanded. Three thousand six hundred more hectares of sugar beets were planted, totaling 23,300 hectares. [Text] [Beijing XINHUA in English 0711 GMT 26 Jul 80 OW]

CSO: 4020

BRIEFS

OUTSTANDING FOREST BUREAU COMMENDED--The Jiangbin Forest Bureau of Yunnan has been named an advanced enterprise and commended by the State Council for its outstanding annual accomplishment in fulfilling logging assignments and in afforestation. By planting 1.02 million mu of new forests in the past some 20 years, it now has 25 percent more forests than when it was established. [Summary] [Beijing RENMIN RIBAO in Chinese 4 Jun 80 p 2]

CSO: 4007

CHINA'S BIGGEST COLD STORAGE PLANT BUILT IN ZHEJIANG

Hangzhou ZHEJIANG RIBAO in Chinese 1 Apr 80 p 3

[Text] A vertical crystal palace has risen in the famous Shenjiagang fishing harbor. If one walks slowly on the avenue, following the shoreline and looking westward, one can see the magnificent outline of the Dagan cold storage plant for marine products. On the raised bridge, blocks of ice may be seen flying down toward the ice-crushing tower on the wharf, where a symphony composed of the sound of the raising and lowering of the crane, the sound of the moving converter belt of the underground fish-transport corridor, the sound of the ammonia air compressor, and the sound of the rotating generator in the engine room may be heard.

The Dagan cold storage plant has a capacity of 10,000 tons. At present, 5,250 tons of marine products and 6,860 tons of ice are being stored at one time, totaling more than 10,000 tons. It is China's largest cold storage plant that has been completed and put into operation. If the contents are rotated five times per year, the cold storage plant can process and store 26,000 tons of frozen fish, enabling each of the 1 million inhabitants of Hangzhou city to eat 50 jin of fresh frozen ocean fish per year. The fact that Dagan cold storage plant has provided favorable conditions for the development of ocean fishery, the improvement of the quality of marine products, the improvement of the people's livelihood in the cities and the countryside, and support for the export trade is clearly demonstrated.

When one walks close to the cold storage plant, the nine-story main storage plant 47 meters high is the first thing to come in view. The height is equivalent to a 15-story building of civilian use. The first level of the main storage plant is the freezing room; the second, third, and fourth stories are the cold storage rooms; the fifth and sixth stories are for ice storage; the seventh story is the icemaking room; the eighth story is the condensation pond and the high water pond (together the two connecting ponds look like a rooftop swimming pool; they have the same area and volume of water as the Hangzhou Tianshui swimming pool); and the ninth story is the cooling tower.

Although the Dagan cold storage plant is large and the stored fish voluminous, when one takes a walk at the site one does not see fish at all. It is not at all like a fish market. Where are the fish? One may go back to the wharf to look for the trace of the fish!

The Dagan cold storage plant has a permanent wharf, measuring 100 meters in length and capable of accommodating a 3,000-ton oceangoing ship. There are also two floating piers for smaller boats. Fresh fish from a ship or a boat are picked up by cranes case by case onto the conveyor belt on the wharf to be moved to the covered site, where workers proceed to classify the catch and place the portion to be processed and frozen onto the conveyor belt of the underground fish-transport corridor, which is 3.8 meters in width and 135 meters in length. Aside from two conveyor belts, there is also a walk for the workers. The corridor is under a road. When one walks on that road, one of course cannot see the fish under his feet.

Off the walk, in the underground fish-transport corridor, one sees a large and bright fish-processing shop. There are automatic fish-washing machines, conveyor belts, and tracks on the fish carts. After the fresh fish are washed, graded, and placed on trays, they are weighed and put into the carts. Each cart holds 300 kg of fish. More than 10 carts are hung on the track to move like a small train. One skilled worker can operate all the carts without any effort.

The track of the fish carts leads from the fish-processing shop toward the freezing room. The first level of the cold storage has five freezing rooms. Each measures 36 meters in length and has two cart-tracks and one blower. When the blower is in operation, the cold wind can reduce the temperature to -23°C. The fish may be frozen hard in 8 hours, and the temperature of the fish may be reduced to -15°C. The frozen fish are then stored in a cold storage room where the temperature is -18°C. They would not spoil for a long time. If one should be locked in the freezing room due to carelessness, one does not have to worry about a tragedy such as the one described in the motion picture "Dali, Xiaoli, and Laoli," because there is a button on the side of the door. When the button is pressed, an alarm will be turned on in the ammonia compressor room and a worker will immediately come to open the door to rescue those inside. During the fishing season, all six freezing rooms are in operation at once, and 240 tons of fresh fish may be frozen every day.

After the fish tray is turned at the completion of the freezing process, a frozen cake of fish weighing 15 kg is moved by the lift to the cold storage units on the second, third, and fourth stories of the building. In the storage, the packing, piling, and discharging are all performed by machines. There is no need of workers to move the products about.

Aside from processing frozen fish, the Dagan cold storage plant can also produce a large quantity of machine-made ice. On the seventh story, the icemaking shop has three icemaking ponds, with a daily capacity of 240 tons of ice. The completed blocks of ice slide down the special spiral glider, to be stored in the ice-storage rooms of the fifth and sixth stories. Ice blocks are dispensed through a raised ice-transport bridge more than 20 meters in the air, to reach the ice-crushing tower on the wharf 100 meters away. The ice-crushing machine crushes the ice before it is delivered to the fishing ships. When one stays on the site of the Dagan cold storage plant, it looks like a modern town, with roads on the ground surface, in the air, as well as under the ground. This type of vertical crisscross roads is rare in China.

The Dagan cold storage plant is a large modernized cold storage for marine products. The work in the cold storage is all either automated or semi-automated. All the necessary items are complete. There are 16 production items and 5 living items to form a total construction area of more than 32,000 square meters. It has the most advanced equipment made in China. With the continued development of the four modernizations, large and small cold storage units for marine products will continuously be constructed in the vicinity of Zhoushan fishing grounds and will supply the people with more and fresher frozen seafood.

6168
CSO: 4007

COMMUNE PRAISED FOR PRODUCTION RESPONSIBILITY SYSTEM

'ZHEJIANG RIBAO' Commentary

Hangzhou ZHEJIANG RIBAO in Chinese 14 May 80 p 1

[Text] The Party Committee of Yangcungiao Commune in Jiande County conscientiously tackled the task of implementing various production responsibility systems. It was a problem well grasped.

Establishing production responsibility systems is a delicate and complex task which ought not to be deemed "all is fine" after setting the "several fixeds." This year the scope for establishing production responsibility systems throughout the province is far greater than last year's, and most systems are of good quality. But in some areas a considerable number of systems have not been implemented. The reasons are multifaceted: some [systems failed] due to contracts being drafted solely by a few cadres so that the masses reluctantly accepted them but either felt insecure or were unable to carry the load; some [systems] got nowhere due to an unreachable target and an unreasonable reward-penalty ratio consequently the masses were afraid to take the risk and did not want to sign the contract; some [systems failed] due to unresolved practical problems such as planning to reimburse one for what he spends on material supplies. Should these problems remain unsolved, even if the production responsibility systems were put into effect, the systems would be relegated to mere formalism.

The experience of Yangcungqiao Commune tells us that it is not difficult to solve the problems. First, pay attention to leadership, have a thoroughgoing workstyle and uncover and solve the problems in time. Second, the mass line must be upheld, and the masses must be allowed to determine the terms of contracts through democratic discussion. Each target of the "fixeds" must conform to reality and leave room for changes. Through hard work, production quotas can be exceeded and rewards be received so that the enthusiasm of the masses can be brought into play. Third, the level of awareness of the local masses and the level of experience of the cadres must be considered as a starting point. The system should not be either overly tedious or have arbitrary measures. Now the busy spring farming season has arrived. Like Yangcunqiao Commune, every commune must examine the circumstances for establishing various production responsibility systems and really grasp the task of their implementation so as to promote the development of all lines of production and achieve an all-round bumper harvest in agriculture for this year.

Yangcunqiao Commune's Experience

Hangzhou ZHEJIANG RIBAO in Chinese 14 May 80 p 1

[Article by Research Team, Zhejiang Provincial Agricultural Committee: "Implementation of Responsibility Systems Well Grasped at Yangcunqiao Commune"]

[Text] By thoroughly investigating the implementation of production responsibility systems, motivating the masses, and insisting on proceeding from actual conditions, the Party Committee of Yangcunqiao Commune in Jiande County has accomplished an excellent implementation of the various responsibility systems.

Since early this year, all the brigades in this commune have universally established responsibility systems for various lines of production. Recently the commune Party committee inspected the Honghu Brigade and found that the responsibility systems in certain units had not been completely implemented. Some units set unreachable targets and failed to solve practical problems, thus resulting in commune members' refusal to sign the contracts; some units failed to proceed from the actual conditions of the brigade in selecting the form of the responsibility system, neglected to adapt to the circumstances, and then demanded uniformity, thus causing dissatisfaction among commune members. After uncovering these problems, members of the commune Party committee separately delved into the problems and conscientiously grasped the implementation of responsibility systems for various lines of production throughout the commune.

1. They relied on the masses to rationally work out responsibility systems for various lines of production. An important factor contributing to the nonimplementation of responsibility systems in some units was failure to fully encourage discussion by the masses during the drafting of the systems. This time, in grasping implementation, the commune Party committee first allowed the cadres, the contractors, and the commune representatives to negotiate jointly a draft acceptable to both sides, then submitted it to all commune members for discussion and approval. The targets of each production responsibility system were set in such a way that, with due effort, the quota could be exceeded and a reward could be received. In order to reduce the fear of taking risks on the part of the contracting unit and individuals, an insurance coefficient was built into the reward-penalty formula. For instance, for the domestic animal farm of the Second Production Team, Honglu Brigade, the target output value was 1,200 yuan; the reward for exceeding the production target

value was set at 20 percent; and the penalty for underproduction value was 5 percent with no penalty for loss between 1,000 to 1,200 yuan. The masses felt more secure with this type of arrangement. After the masses had fully aired their views and the groundwork for a settlement had been laid, the cadres and the commune members happily signed the contract.

2. Proceeding from the actual conditions of each unit, the form of each production responsibility system was suited to the work, was flexible, and void of arbitrary measures. The commune Party committee in combining the results of their inspection, not only summed up differing types of experiences and popularized them, but also fully respected the autonomy of the production teams and allowed the brigades and production teams to choose the form for the responsibility system according to the actual situations of their units. For example, the grains and oils processing plant, the livestock farm, the farm, the seed team, the tea team, the orange team, the mushroom house and the tractors, almost all adopted the "several fixeds-one reward" responsibility system. However, the contents of the systems varied in their degrees of complexity, depending on the differing characteristics of the various lines of work and the wishes of the masses; some implemented fixed production, fixed work, and fixed cost; some fixed production and work and excluded cost, some only fixed the quality or value of output without fixing the cost.

As for work on field crops, each team also was allowed to proceed from its actual situations and adopt different forms of responsibility systems according to the seasons. For example, during the three major farming seasons, the production teams usually took into account the needs of different farming activities like harvesting or planting, and the labor situation and adopted the system of "dividing manpower into temporary groups, fixing quality and quantity, contracting out work to the groups, and determining pay by the quota." The intertilling, pulling out rye grass, weeding and ditch construction, for higher yields of the three major field managements (spring grains, early rice, and late rice) all used the system of "assigning responsibility to each individual, specifying work for each field, fixing quality and quantity, and terminating work after checking"; the field has to be managed thoroughly throughout the whole process. For pest control and fertilization, the production teams coordinated the organization of the labor force and put into practice the "assignment of responsibility to the groups and calculating rewards according to quotas." A management responsibility system for a person specially assigned a task was established for tending field irrigation. As for odd or scattered production items such as fish-raising ponds in the mountains, most production teams contracted them out to individual commune members or several members, with prescribed output as well as rewards for exceeding the quota. In this manner, both the cadres and commune members were quite satisfied.

Having gone through the inspection, solved the problems, and enhanced the implementation of responsibility systems, to date, each of the 120 production teams in this commune has laid down plans for "knowing 1 year ahead." Commune enterprises and the production teams' mushroom house, livestock farm, fish pond, etc, have universally set up responsibility systems with "several fixeds and several rewards." Of the 46 tractors in the whole commune, 42 have adopted individual auditing and established a "five fixeds, two guarantees, one reward" responsibility system. All the teams also have coordinated the current production and set up management responsibility systems for spring grains, early rice and duckweed.

9640
CSO: 4007

FOOD PLANT HELPS COMMUNES SET UP CHICKEN FARMS

Hangzhou ZHEJIANG RIBAO in Chinese 19 May 80 p 1

[Article by Ni Qinxuan [0242 0530 1357], a reporter at the reporting station in Jiaxing Prefecture: "Wuxing Food Plant Helps Communes Set Up More Than 100 Chicken Farms"]

[Text] Wuxing Food Plant exerted great effort to set up poultry bases, made the enterprise become increasingly prosperous, and, for 7 successive years, exceeded the quota for the export production plan. Wuxing Food Plant is an enterprise engaging primarily in the production of frozen chicken for export. In the past, owing to its dependence on purchasing raw materials [needed] for production from the market, the plant led a life of "worrying about one meal at a time." Furthermore, because of lack of uniformity in breeds and standards, it was difficult to meet the standard and demand for export. After critical analyses, the plant party branch felt that only by properly setting up poultry bases could the plant firmly control the initiative in production and thereby enlarge and invigorate the export business. Consequently, a department under the party specifically established a production-base section manned by six cadres to oversee the bases in a concrete way. In accordance with such requirements as specifications, breed and quantity for exporting frozen chicken, they went down to the villages, communes and brigades and successively set up 159 chicken farms in 23 communes throughout the county. Treating these bases as a part of the whole enterprise and as the front line of production, they adopted every type measure to insure the production needs of the bases with respect to chicken breeding, chicken feed, fuel, and medicine. Each year they also supplied the commune and brigade chicken farms with 700,000-800,000 chicks, sent specialists to the bases to teach chicken-raising techniques, made rounds to inspect the production situation and helped improve the management of the chicken farms. They specifically built feed shops for commune and brigade chicken farms to blend appropriate nutrients in the chicken feed and facilitate the feed supply. They organized a chicken disease prevention unit to distribute seasonal plague control medicine, and develop work on general disease prevention and eradication. They also tried every possible way to provide the sawdust for chicken coop beddings, heating fuel and feeding troughs that were needed by the chicken farms.

because the plant paid special attention to establishing the bases, raw materials for production have shifted from "not enough to eat" to "unable to eat all." Since 1973, these bases, on the average, annually supply over 800 tons of quality live chickens to the plant, thus laying a solid foundation for expanding exports. In 7 years, the plant exported more than 4,000 tons of frozen chicken with profits reaching 3.830 million yuan. The enterprise has become increasingly prosperous and has gradually formed a "one dragon" streamline production line that includes chicken breeding, hatching, slaughtering, processing, freezing, and exporting. At the same time, the business lent support to agriculture, increased the collective income of the communes and brigades and was welcomed by a multitude of peasants. In addition, it increased the fowl supply for local markets. In recent years, the plant has supplied an average of 200 tons of fresh chicken and chicken giblets, intestines and feet per year to the market.

9560
CSO: 4007

BRIEFS

HOG RAISING--As of mid-July, Zhejiang Province had 15.17 million hogs in stock, an increase of 420,000 head over the same period last year. The fine situation is attributable to the implementation of such policies as the increased buying price for hogs, which aroused the peasants' enthusiasm about hog raising. [Hangzhou Zhejiang Provincial Service in Mandarin 0400 GMT 29 Jul 80 OW]

RAPESEED PROCUREMENT--Hangzhou, 28 Jul--As of 10 July, Zhejiang Province had produced 273.02 million jin of rapeseed, setting an all-time high. This was an increase of 9.7 million jin over last year's total procurement and overfulfilled the state procurement plan by 99.28 percent. [Beijing XINHUA Domestic Service in Chinese 0752 GMT 28 Jul 80 OW]

CSO: 4007

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Genetics

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ORG: Both of the Institute of Genetics, Fudan University, Shanghai

TITLE: "A Genetical Study on Sex-Reversal in the Fowl"*

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 2, Jun 80 pp 103-110

EXCERPTS FROM ENGLISH ABSTRACT: ens that cease to lay eggs and reverse the sex to cock have been reported not infrequently in the literature. But so far as we know, the genetical studies on a genuinely sex-reversed fowl with a gene marker have never been reported.

The opportunity was presented to us of securing a fowl of the variety Rhode Island Red which had a record of egg-laying, but at about three years old began to assume the characters of male, and over half a year later eventually developed into a functional male. We mated this sex-reversed male to a number of normal hens of Barred Rock. The viability of F_1 zygotes resulting from this mating was rather low, most of them dying in the last week of incubation or in

[Continuation of YICHUAN XUEBAO No 2, Jun 80 pp 103-110]

the first few weeks of life. However, it was possible to determine the plumage pattern and the sex simultaneously in 31 instances of those either hatched or sufficiently advanced at the time of death in the shell for their plumage pattern and sex to be determined.

The results are in accord with the explanation that although the phenotypic sex of this bird had changed completely from a functional female to a functional male, the genotypic sex remained as it was.

While examining the sex-ratio of the offspring from the sex-reversed male, we noticed that the ratio of female to male differed significantly from the expectancy of 2:1, although the ratio of barred to non-barred in females was in agreement with the theoretical ratio of 1:1. The fact that the number of females in the F_1 offspring was remarkably reduced follows the rule that whenever one sex is absent or rare, it is always the heterogametic sex, in the case reported here being the females.

After the end of the breeding experiments the sex-reversed bird was sacrificed. It was found to have a pair of well developed testes and their respective vasa deferentia, although upon careful examination a remnant of oviduct was visible

[Continuation of YICHUAN XUEBAO No 2, Jun 80 pp 103-110]

on the left side near the cloaca. No tumor or other pathological condition could be observed. Therefore, it was impossible to ascertain whether the testes of this sex-reversal resulted directly without any pathological involvement, or whether pathological conditions had once occurred, but since disappeared.

* Professor TAN Jiazhen [6151 1367 2823] of Fudan University reviewed the present article.

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TITLE: "Genetic Studies for Plasmid Involved in Qingfengmycin Biosynthesis in Streptomyces qingfengmyceticus"*

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 2, Jun 80 pp 111-118

TEXT OF ENGLISH ABSTRACT: This paper reported that the ability of Qm biosynthesis in Streptomyces qingfengmyceticus is genetically unstable; it can be eliminated spontaneously or inductively to produce the Qm non-producing colonies, but the q^- mutant as contrasted with the q^+ strain is genetically stable. It cannot be reversed to the q^+ phenotype spontaneously or inductively (frequently less than 10^{-10}), but it can regain the Qm biosynthesis ability to produce q^+ transfer-conjugants when q^+ and q^- strains were mixed grown on the

[Continuation of YICHUAN XUEBAO No 2, Jun 80 pp 111-118]

same slant and then the mixed spore suspension was selected by using the drug resistance of auxotrophs as selected marker. Therefore, we consider that there is a plasmid involved in the Qm biosynthesis in *S. qingfengmyceticus*.

* LIU Chengpei [0491 2052 3099] took part in some of the present study.

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TITLE: "Molecular Basis of Remote Hybridization--True Recombination of Sorghum DNA Sequences with Rice Genomes during Remote Hybridization"*

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 2, Jun 80 pp 119-122

TEXT OF ENGLISH ABSTRACT: The chromosomes of the stable hybrids of rice x sorghum bred by the Institute of Crop Breeding and Cultivation, Chinese Academy of Agricultural Sciences, are identical with those of rice (their mother plants) as observed by light microscope. The phenotypes of the hybrids are changed in certain aspects with some of the male parental characters. Such changed characters are inheritable. We are of the opinion that the whole chromosomes of distantly related plants are quite different and may often be mutually exclusive, but certain individual gene or DNA segments may show more or less mutual affinity, thus rendering them capable of recombination within the female genomes. In our experiment we have used sorghum DNA as a probe. The sorghum

[Continuation of YICHUAN XUEBAO No 2, Jun 80 pp 119-122]

DNA is passed through an immobilized rice DNA column to remove partially homologous DNA sequences. The data on the kinetics of renaturation suggest that sorghum DNA sequences are held on rice genomes.

* HU Tianxi [5170 1131 0823], biology Department, Shanghai Teachers' College, and WENG Jian [5040 1017] of our research group took part in the study.

AUTHOR: SHAO Qiquan [6730 0796 0356]
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TITLE: "Semi-Wild Wheat from Xizang (Tibet)"*

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 2, Jun 80 pp 149-156

TEXT OF ENGLISH ABSTRACT: Semi-wild wheat was discovered during the scientific expedition to the Qinghai-Xizang plateau in 1974. A number of specimens were collected and analyzed genetically and cytologically. Semi-wild wheat usually was grown as well as weed in barley and wheat fields. The matured spikelets were freely separated from the spike and had fallen on the ground, and thus sprouted naturally when conditions permitted. It was first discovered in Jitan district, Chajia county, Changdu prefecture, and samples were collected later in Jiacha and Gunga counties while it was found in Longzi and Renbu counties also. Genetical study on spike row progenies of semi-wild wheat showed that the majority were stable with brittle rachis, although segregation in this trait was found in a few lines. Semi-wild wheat could be grouped into various varieties

[Continuation of YICHUAN XUEBAO No 2, Jun 80 pp 149-156]

and polymorphism was apparently demonstrated. The phylogenetic position of the semi-wild wheat in the evolution of wheat is theoretically an important problem and worth further investigation. A significant difference was observed between semi-wild wheat in Xizang and *Triticum spelta*. The spike of *T. spelta* has fragile rachis which usually disarticulates above the pedicel with a pedicel attached to the ventral side of the spikelet, while that of semi-wild wheat in Xizang breaks below the pedicel, so that each spikelet is set on its own pedicel. The mode of disarticulation of rachis of semi-wild wheat is similar to that of *Triticum aestivum* ssp. *yunnanensis*, but the former is more primitive than the latter, because in *yunnanensis* the rachis will be broken when pressed with a certain force and in the semi-wild wheat it is separated freely into brittle spikelets at maturity which is rarely observed in hexaploid wheats. Observations of semi-wild wheat root tip squashes revealed 2n=42, a hexaploid. It can be crossed with common wheat very easily, but sterile lines are sometimes segregated in offsprings, indicating probably some kind of interspecific isolating mechanism might occur. In practice, it can be used as a new source for hybrid wheat breeding. According to the above-mentioned unique characteristics, we suggest that the semi-wild wheat could be established separately as a new subspecies of *Triticum aestivum* named *tibetanum* ssp. nov. Shao.

* The following helped with the present study: JIN Shanbao [6855 0810 1405], WU Guangyi [0702 1767 6942], YU Dejun [0205 1795 0193] and CHEN Shixiang [7115 0013 7534].

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ORG: LI of the Department of Biology, Harbin Teachers' College; SUN of Heilongjiang Academy of Agricultural Sciences, Harbin

TITLE: "A Study on the Heredity of the Intermediate Form Crossing Between Wheat (*Triticum aestivum*) and Sky-Blue Oat (*Agropyron glaucum*)"

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 2, Jun 80 pp 157-164

TEXT OF ENGLISH ABSTRACT: Distant crossing intermediate Form 2, 3, 5 and 1--all these intermediate types with common wheat and a sky-blue oat grass chromosome set are selected from the posterities (common wheat x sky-blue oat grass) with common wheat chromosome set AABBDD and sky-blue oat grass chromosome set EE (or FF).

Analysis is made on the cells and heredity of the intermediate types. New varieties and lines are established through the crossing between the intermediate type and common wheat. The authors consider it of importance in theory and practice to study the cell heredity for the intermediate types.

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AUTHOR: ZENG Junzhi [2582 0689 4363]
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TITLE: "The Early Androgenesis in In Vitro Wheat Anthers under Ordinary and Low Temperatures"*

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 2, Jun 80 pp 165-173

TEXT OF ENGLISH ABSTRACT: The early androgenesis of the microspores in anther culture of wheat (*Triticum aestivum*) is observed in detail and seven types of androgenesis are described. In the former three types (A, A_1 and A_2), the first mitosis of pollen grains is of unequal division, resulting in the production of one large vegetative and one small generative cell, and the vegetative cell divides and forms calli, embryoids and multinucleate pollen grains. In the latter four types (B, B_1, B_2, B_3), the first mitosis is characterized as an equal division, which produces two similar cells or two similar nuclei. In this case calli, embryoids, as well as multinucleate pollen grains, are formed from microspores directly. From the analysis and observations on the developmental pathways of calli and embryoids, it is found that equal division (B pathway) is the major pathway in regeneration of pollen plants in wheat.

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Various abnormalities in the *in vitro* development of pollen grains are observed. For example, synchronous divisions at different stages of mitosis, such as prophase, metaphase and anaphase, and different nuclear fusion types, such as generative with generative nucleus, vegetative with generative one and vegetative with vegetative one, occur, and sometimes endomitosis is also observed. Doubled pollen grains and calli may be formed in this way and non-haploid plants may be produced. When anthers are first cultured at low temperatures (-2 - 2°C or -5 - 0°C) for 48 hours, the frequencies of occurrence of the above-mentioned phenomena are increased.

*The following also helped: HU Han [5170 0698], HAO Shui [6787 3055], JING Jiankang [2529 0256 1660] and JIA Shuange [6328 7175 1230].

AUTHOR: LI Taigui [2621 1132 6311]
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DAI Yaoren [2071 1031 0088]

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TITLE: "The Effect of the Cytoplasm with Different Fertilities on the β-Amylase Activity and Its Isozyme in Rice Leaves"

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 2, Jun 80 pp 174-178

TEXT OF ENGLISH ABSTRACT: β-amylase activities and their isozymes in 12 groups of male-sterile lines of rice (belonging to the type of nucleoplasm interaction), as well as their maintainer lines and F_1 hybrids are detected. It is found that the male-sterile and F_1 hybrids are approximately the same in their β-amylase activities, while their enzyme activities are higher than those of their maintainer lines. This implies that male-sterile cytoplasm may influence the expression of nuclear genes which code the β-amylases.

In addition, it is suggested that β-amylase may be a biochemical index of the fertility in rice plants in the early stage.

AUTHOR: DU Rongqian [2629 2837 7505]
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ORG: Both of the Department of Biology, Nankai University, Tianjin

TITLE: "Genetic Analysis of the Contribution of Leaf Area to Ear Weight in Wheat"

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 2, Jun 80 pp 179-184

TEXT OF ENGLISH ABSTRACT: The relation between each leaf area of the last four leaves and ear weight is studied by means of multiple regression. The phenotypic regression is divided into the genetic regression and the environmental regression. Results of the two crosses show that the important factor contributing to ear weight is not the flag leaf but the third leaf (from the top). As there are negative genetic correlations and positive environmental correlations between each leaf area and ear weight, we cannot select for leaf area by phenotypic expression, nor can we attempt to increase ear weight by increasing the leaf area. The area of each of the leaves ought to be optional under a given condition.

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ORG: Both of the Longxi Institute of Agronomy, Fujian Province

TITLE: "The Breeding and Utilization of Naked Seed Rice"*

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 2, Jun 80 pp 185-188

TEXT OF ENGLISH ABSTRACT: This paper shows the new type of naked seed rice which was isolated from F_4 and F_3 generations of remote hybrids between rice (Oryza sativa) and wheat (Triticum aestivum) in 1970 and 1978 respectively. Morphology of plant and inflorescence of the naked seed which was isolated the first time are like those of rice, but the structure of spikelet and morphology of seeds of naked seed rice differ from those of rice and are closer to those of wheat. The seed set now is only 14.66 percent and weight of kilograin is 12.5 g. The tendency of heightening the seed set and 1000-grain weight is present by means of back crossing. Therefore, it is a good material for becoming a giant grain type of rice. Three plants of the naked seed rice which were isolated from the F_3 generation of the second remote crossing for repetition in 1978 are completely sterile. They will be kept growing by means of vegetative propagation for further study.

[Continuation of YICHUAN XUEBAO No 2, Jun 80 pp 185-188]

* Special thanks to SHAO Qiquan [6730 0796 0356], Institute of Genetics, Chinese Academy of Sciences, and JIANG Xingcun [5592 5281 6722].

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TITLE: "The Induction of Citrus Pollen Plants in Artificial Media"*

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 2, Jun 80 pp 189-191

TEXT OF ENGLISH ABSTRACT: Haploid plantlets are successfully induced from the pollen of Citrus microcarpa Bunge. The unopened flower buds are cold-treated at a low temperature of 5°C, and the anthers plants on the N_6 and other media for 10 weeks, after which several small round embryoids emerge from the split anthers. They differentiate roots, stems and leaves, and gradually become normal whole plants. More than 20 small plants are obtained in our experiment. The largest plant reaches the growing stage of four leaves. It is expected that more embryoids would differentiate into plantlets.

Cytological observation shows that the chromosome number in the root tip cells is 9, showing haploid. This finding again proves that the plantlets have the same number of chromosomes as the original pollen.

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* LIANG Tiangan [2733 1131 1626] helped with the chromosome typing. CHEN Xiuming [7115 4423 2494], YE Maohui [5509 2021 6540] and WENG Youde [5040 0645 1795] helped with the photographs.

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